Fastener Tightening Specifications

Application	Specification	
	Metric	English
Exhaust Manifold to Cylinder Head Retaining Bolts - 3.6L Engine	20 N·m	15 lb ft
Exhaust Manifold to Cylinder Head Retaining Bolts - 6.0L Engine	20 N·m	15 lb ft
Exhaust Manifold Heat Shield to Exhaust Manifold Retaining Bolts - 3.6L Engine	10 N·m	89 lb in
Exhaust Manifold Heat Shield to Exhaust Manifold Retaining Bolts - 6.0L Engine	10 N·m	89 lb in
Catalytic Converter to Exhaust Manifold Retaining Nuts - 3.6L Engine	45 N·m	33 lb ft
Catalytic Converter to Exhaust Manifold Retaining Nuts - 6.0L Engine	45 N·m	33 lb ft
Intermediate Exhaust Assembly to Catalytic Converter Retaining Nuts	40 N·m	30 lb ft
Rear Muffler to Intermediate Exhaust Assembly Retaining Nuts	45 N·m	33 lb ft
Centre Insulator Hanger Bracket to Differential Retaining Bolt	45 N·m	33 lb ft
Rear Insulator Hanger Bracket to Body Retaining Bolts	26 N·m	19 lb ft
Front Exhaust Foil Heat Shield to Body Retaining Bolt	4 N·m	35 lb in
Centre Exhaust Heat Shield to Body Retaining Bolts	4 N·m	35 lb in
Exhaust Muffler Heat Shield to Body Retaining Bolts	4 N·m	35 lb in
Fuel Tank Heat Shield to Fuel Tank Retaining Nuts	4 N·m	35 lb in

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Exhaust System Alignment

Warning: Refer to Exhaust Service Warning in the Preface section.

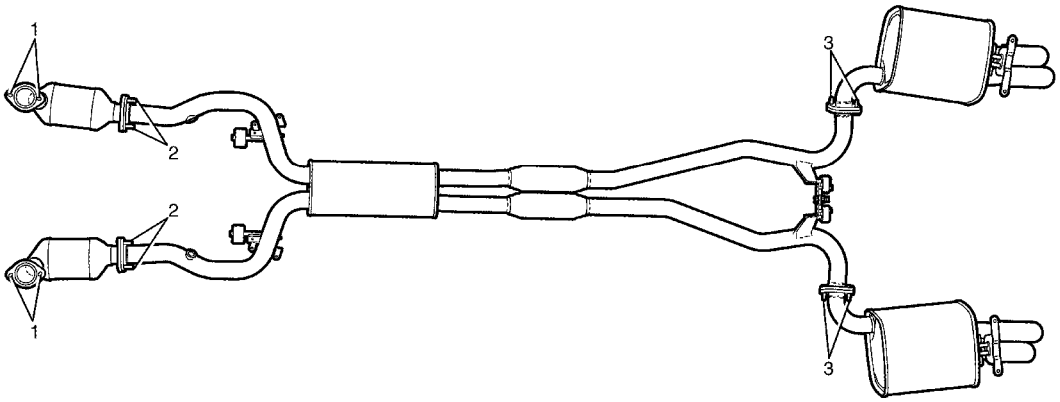
Caution: Refer to Exhaust System Inspection Caution in the Preface section.

Note: This procedure is only to be performed if the exhaust is incorrectly aligned or is not clear of all other components or chassis.

Note: Make sure all exhaust retaining nuts and bolts are loose before conducting this procedure.

Note: The L98 exhaust is pictured but flange bolts are in the same location on LY7.

Caution: Refer to Fastener Caution in the Preface section.



1. Initially tighten catalytic converter to exhaust manifold retaining nuts (1) to **20 N·m (15 lb ft)**.
2. Tighten catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.
3. Tighten exhaust crossover pipe to catalytic converter retaining nuts (2) to **40 N·m (30 lb ft)**.
4. Tighten muffler to exhaust crossover pipe retaining bolts (3) to **45 N·m (33 lb ft)**.

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Exhaust Manifold Replacement - Left Side (V8)

Removal Procedure

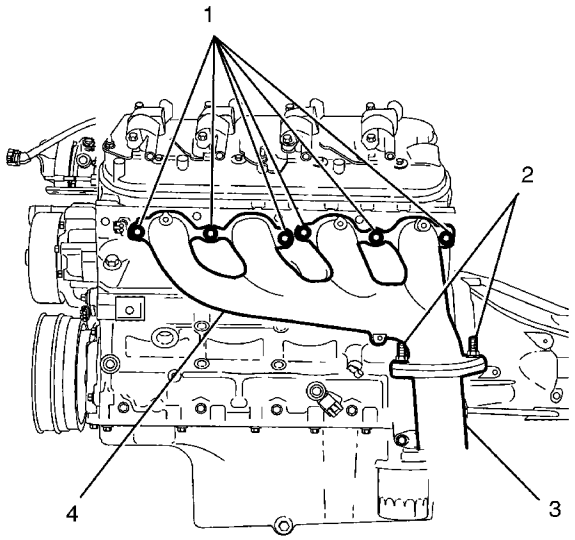
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the air cleaner assembly. Refer to Air Cleaner Assembly Replacement.
5. Remove the left side spark plug leads. Refer to Spark Plug Replacement.
6. Remove the left side spark plugs from the cylinder head. Refer to Exhaust Manifold Heat Shield Replacement - Right Side.
7. Remove the left side exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side.
8. Remove the engine coolant temperature sensor. Refer to Engine Coolant Temperature Sensor Replacement.



Note: The left catalytic converter to exhaust manifold retaining nuts (2) are single use parts. They must be discarded after removal.

9. Remove the left catalytic converter to exhaust manifold retaining nuts (2).

   Discard the nuts.

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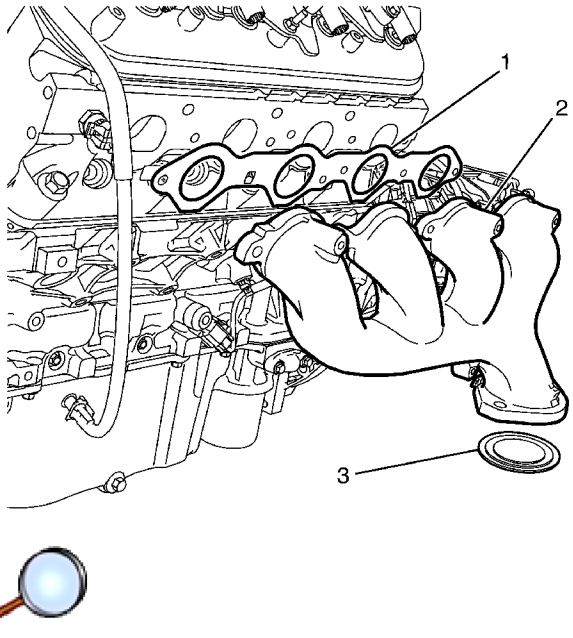
10. Disconnect the left catalytic converter (3) from the exhaust manifold (4).
11. Loosen the exhaust manifold to cylinder head retaining bolts (1) working from the outside to the centre.

    Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

12. Remove the exhaust manifold to cylinder head retaining bolts (1).

    Discard the bolts.



Note: Make sure that the surrounding wiring harness and electrical connectors are not damaged when removing the exhaust manifold (2).

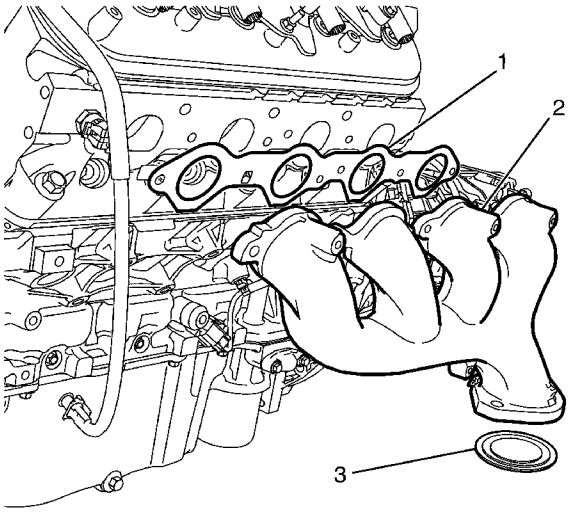
Note: The exhaust manifold gasket (1) and sealing ring (3) are single use parts. They must be discarded after removal.

13. Remove the exhaust manifold (2).

    Discard the exhaust manifold gasket (1) and sealing ring (3).

Installation Procedure

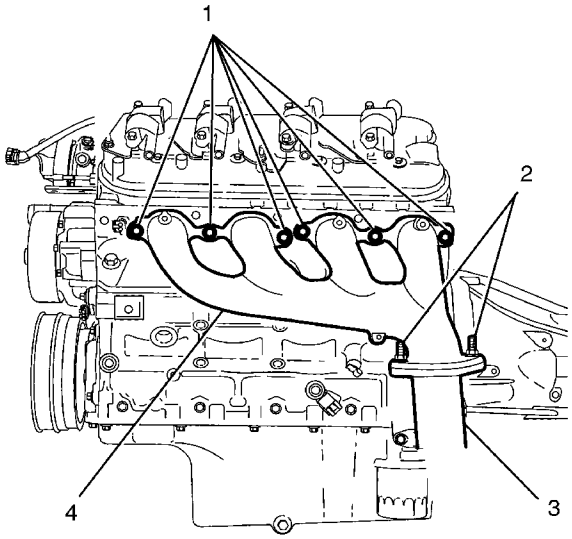
1. Clean and inspect the exhaust manifold. Refer to Exhaust Manifold Cleaning and Inspection.



2. Install a NEW exhaust manifold gasket (1) and NEW sealing ring (3) to the exhaust manifold (2).

Caution: Refer to Exhaust System Inspection Caution in the Preface section.

3. Install the exhaust manifold assembly to the engine.



4. Install the NEW exhaust manifold to cylinder head retaining bolts (1).

Caution: Refer to Fastener Caution in the Preface section.

5. Tighten the exhaust manifold to cylinder head retaining bolts (1) working from the centre to the outside to **20 N·m (15 lb ft)**.

Note: Make sure the sealing ring is seated correctly.

6. Lift the left catalytic converter (3) up and forward to connect to the exhaust manifold (4).
7. Clean the threads of the exhaust manifold to catalytic converter retaining studs with a suitable cleaning solvent.
8. Install the NEW left catalytic converter to exhaust manifold retaining nuts (2) and tighten to **45 N·m (33 lb ft)**.
9. Install the engine coolant temperature sensor. Refer to Engine Coolant Temperature Sensor Replacement.
10. Remove the install the left side exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side.
11. Install the left side spark plugs to the cylinder head. Refer to Spark Plug Replacement.
12. Install the left side spark plug leads. Refer to Spark Plug Wire Inspection.
13. Install the air cleaner assembly. Refer to Air Cleaner Assembly Replacement.
14. Install the engine cover. Refer to Engine Cover Replacement.
15. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Exhaust Manifold Replacement - Left Side (V6)

Removal Procedure

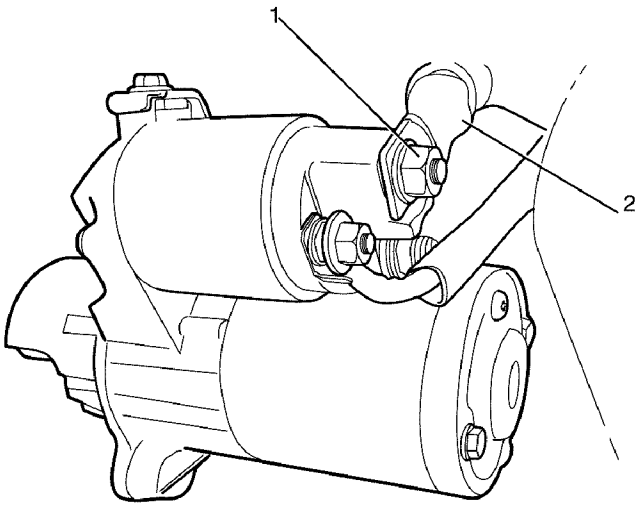
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and ConnectionBattery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the left pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.
5. Remove the exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side .
6. Remove the oil level indicator tube. Refer to Oil Level Indicator and Tube Removal .
7. Remove the left catalytic converter. Refer to Catalytic Converter Replacement - Left Side .



8. Remove the battery positive cable retaining nut (1) from the starter motor solenoid.
9. Remove the battery positive cable (2) from the starter motor.

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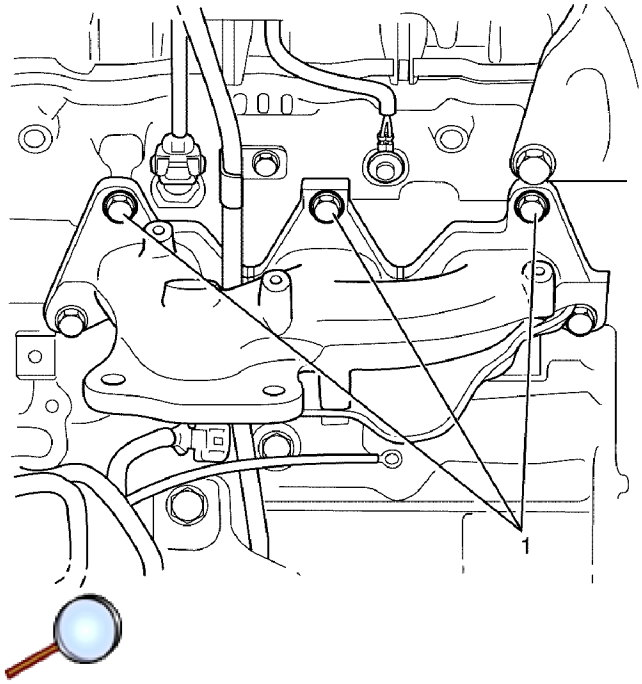


Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

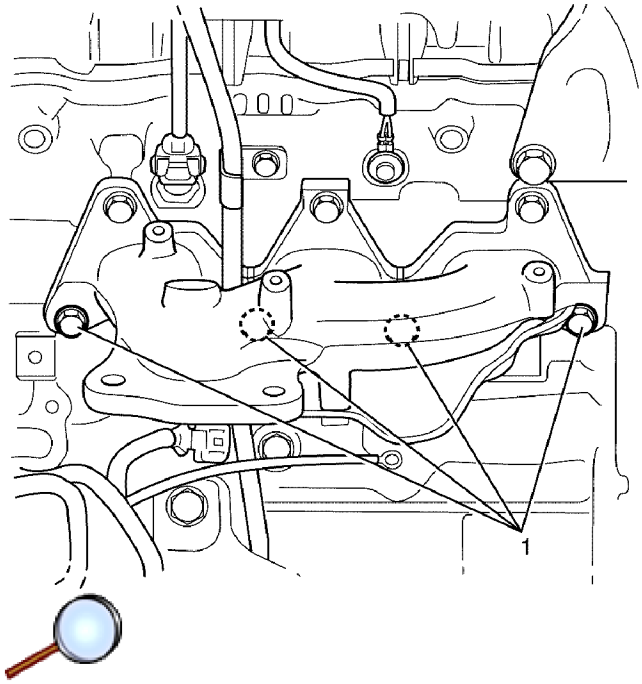
10. Remove the exhaust manifold to cylinder head retaining bolts (1).

    Discard the bolts.

    Warning: Refer to Safety Glasses Warning in the Preface section.

    Danger: To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

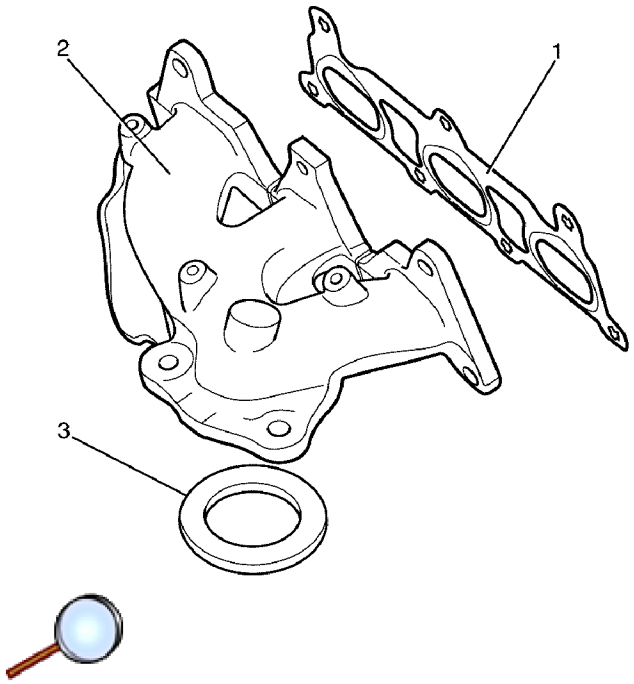
11. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

12. Remove the exhaust manifold to cylinder head retaining bolts (1).

    Discard the bolts.



Note: Make sure that the surrounding wiring harness and electrical connectors are not damaged when removing the exhaust manifold (2).

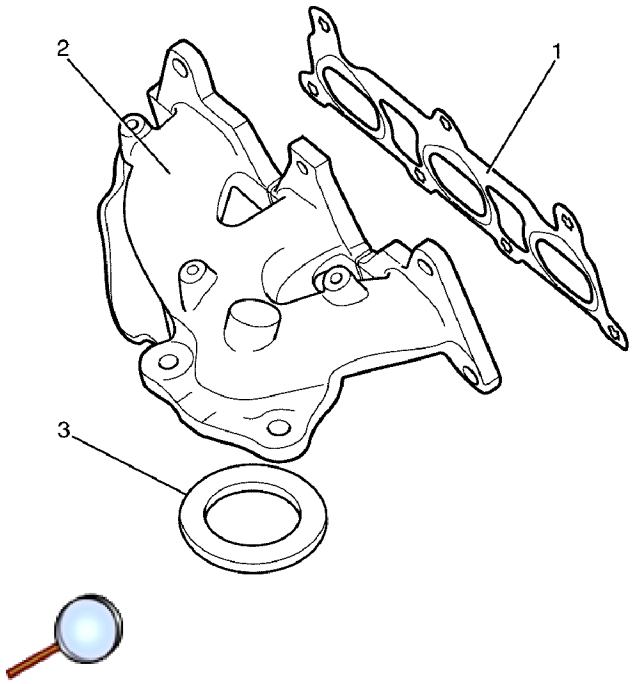
Note: The exhaust manifold gasket (1) and sealing ring (3) are single use parts. They must be discarded after removal.

13. Remove the exhaust manifold (2) from the engine assembly.
14. Separate the exhaust manifold (2) from the exhaust manifold gasket (1) and sealing ring (3).
15. Discard the exhaust manifold gasket (1) and sealing ring (3).

Installation Procedure

Caution: Refer to Exhaust System Inspection Caution in the Preface section.

1. Inspect the exhaust manifold before installation. Refer to Exhaust Manifold Cleaning and Inspection - Left Side.



Note: Make sure the sealing ring is seated correctly.

2. Install a NEW exhaust manifold gasket (1) and NEW sealing ring (3) to the exhaust manifold (2).

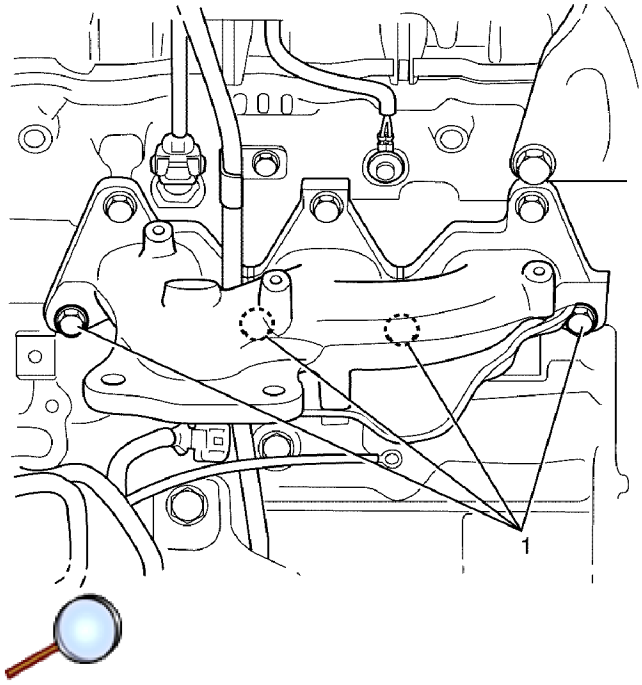
   Warning: Refer to Safety Glasses Warning in the Preface section.

   Danger: To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Note: A suitable support must be used to support the exhaust manifold while the vehicle is being lowered.

4. Install the exhaust manifold assembly (2) to the engine.

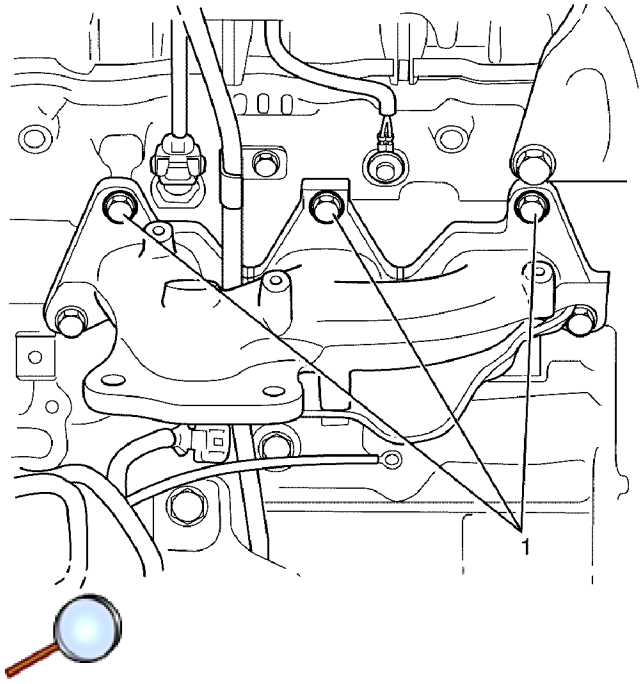


Note: Do not fully tighten the exhaust manifold to cylinder head retaining bolts (1) at this stage.

5. Install NEW exhaust manifold to cylinder head retaining bolts (1).

Caution: Refer to Fastener Caution in the Preface section.

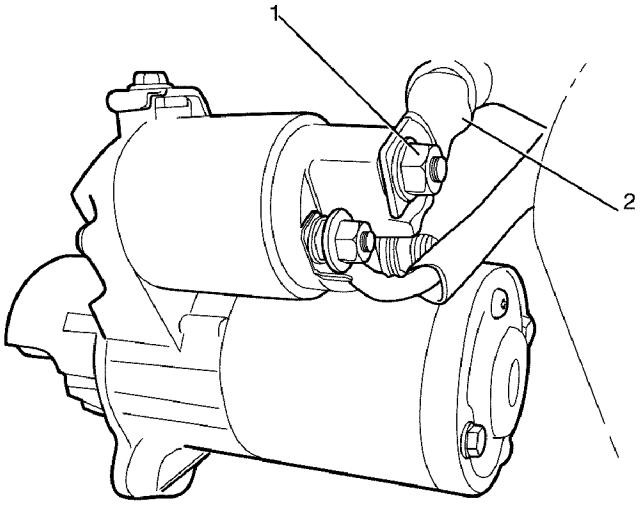
6. Tighten the exhaust manifold to cylinder head retaining bolts (1) working from the centre to the outside to **20 N·m (15 lb ft)**.
7. Lower the vehicle.



Note: Do not fully tighten the exhaust manifold to cylinder head retaining bolts (1) at this

stage.

8. Install NEW exhaust manifold to cylinder head retaining bolts (1).
9. Tighten the exhaust manifold to cylinder head retaining bolts (1) working from the centre to the outside to **20 N·m (15 lb ft)**.



10. Install the battery positive cable (2) to the starter motor.
11. Install the battery positive cable retaining nut (1) to the starter motor solenoid and tighten to **10 N·m (89 lb in)**.
12. Install the left catalytic converter. Refer to Catalytic Converter Replacement - Left Side .
13. Install the exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side .
14. Install the left pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 .
15. Install the engine cover. Refer to Engine Cover Replacement.
16. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Exhaust Manifold Replacement - Right Side (V8)

Removal Procedure

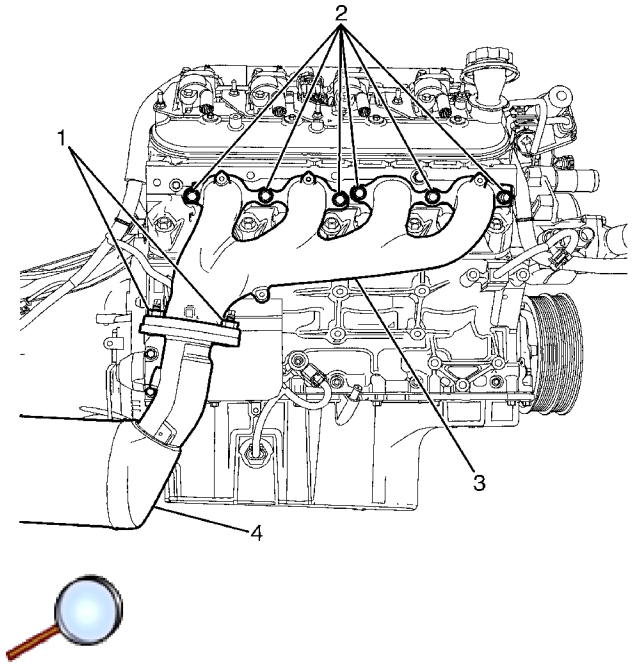
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement.
5. Remove the right side spark plug leads. Refer to Spark Plug Wire Replacement.
6. Remove the right side spark plugs from the cylinder head. Refer to Spark Plug Replacement.
7. Remove the right side exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side.



Note: The right catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

8. Remove the right catalytic converter to exhaust manifold retaining nuts (1).

Discard the nuts.

9. Disconnect the right catalytic converter (4) from the exhaust manifold (3).
10. Loosen the exhaust manifold to cylinder head retaining bolts (2), working from the outside to

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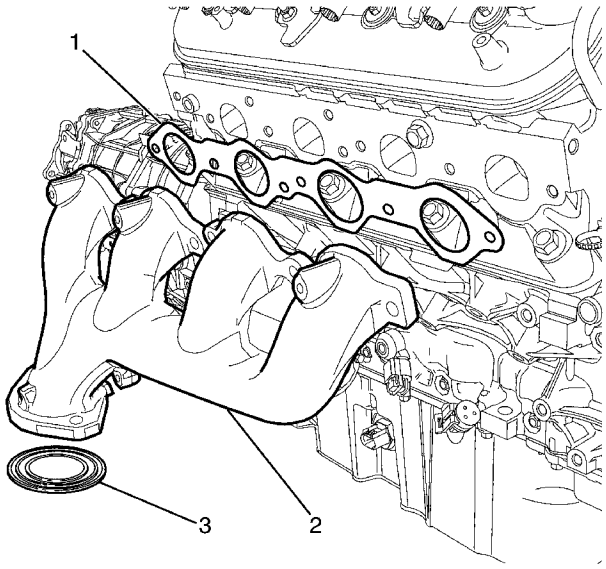
the centre.

Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

11. Remove the exhaust manifold to cylinder head retaining bolts (2).

    Discard the bolts.



Note: Make sure that the surrounding wiring harness and electrical connectors are not damaged when removing the exhaust manifold (2).

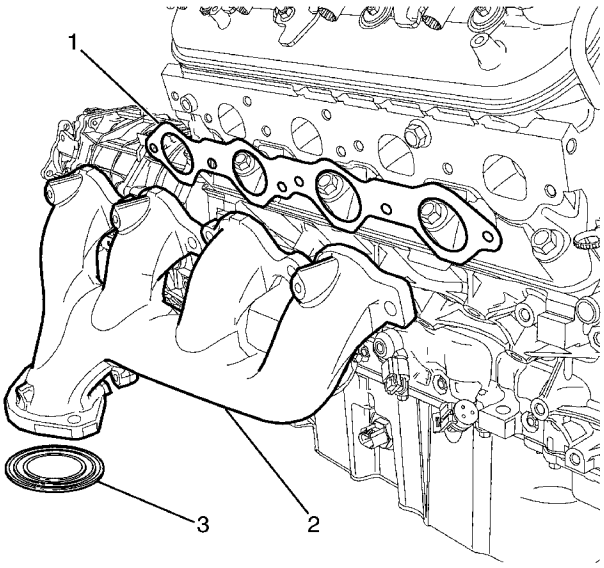
Note: The exhaust manifold gasket (1) and sealing ring (3) are single use parts. They must be discarded after removal.

12. Remove the exhaust manifold (2).

    Discard the exhaust manifold gasket (1) and sealing ring (3).

Installation Procedure

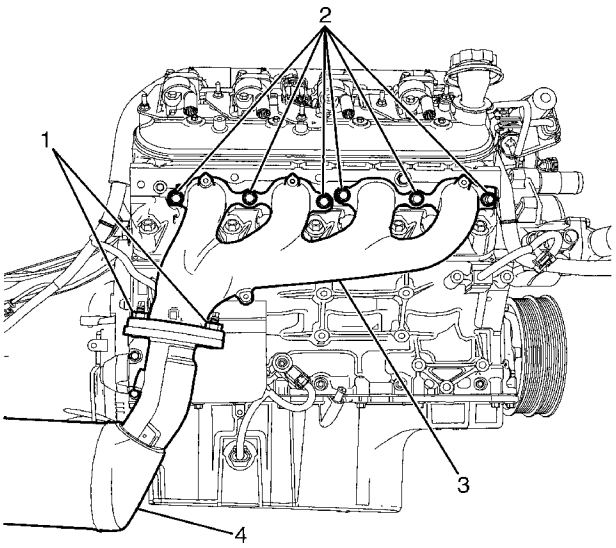
1. Clean and inspect the exhaust manifold. Refer to Exhaust Manifold Cleaning and Inspection.



2. Install NEW exhaust manifold gasket (1) and NEW sealing ring (3) to the exhaust manifold (2).

Caution: Refer to Exhaust System Inspection Caution in the Preface section.

3. Install the exhaust manifold assembly to engine.



4. Install the NEW exhaust manifold to cylinder head retaining bolts (1).

Caution: Refer to Fastener Caution in the Preface section.

5. Tighten the exhaust manifold to cylinder head retaining bolts (2) working from the centre to the outside to **20 N·m (15 lb ft)**.

Note: Make sure the sealing ring is seated correctly.

6. Lift the right catalytic converter (4) up and forward to connect to the exhaust manifold (3).
7. Clean the threads of the exhaust manifold to catalytic converter retaining studs with a suitable cleaning solvent.
8. Install the NEW right catalytic converter to exhaust manifold retaining nuts (1) and tighten to **45 N·m (33 lb ft)**
9. Install the right side exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side.
10. Install the right side spark plugs to the cylinder head. Refer to Spark Plug Replacement.
11. Install the right side spark plug leads. Refer to Spark Plug Wire Inspection.
12. Install the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement.
13. Install the engine cover. Refer to Engine Cover Replacement.
14. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Exhaust Manifold Replacement - Right Side (V6)

Removal Procedure

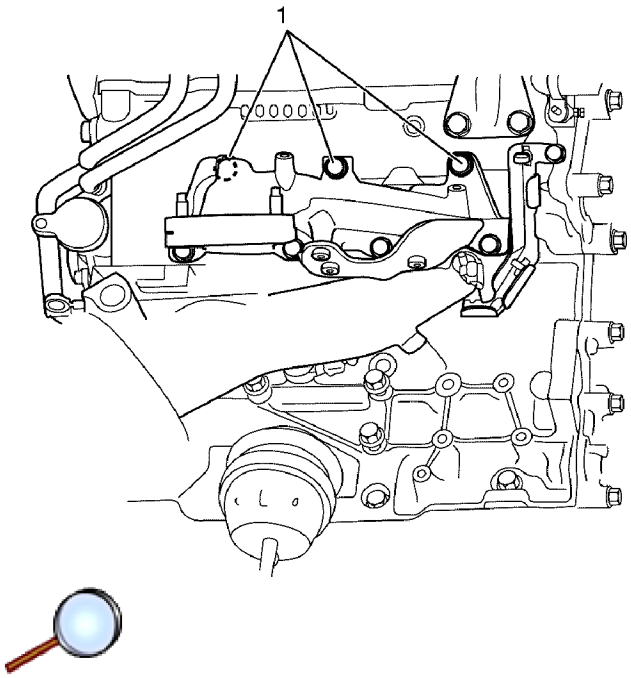
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and ConnectionBattery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the right pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
5. Remove the exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side .
6. Remove the right catalytic converter. Refer to Catalytic Converter Replacement - Right Side .



Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

7. Remove the exhaust manifold to cylinder head retaining bolts (1).

Discard the bolts.

Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

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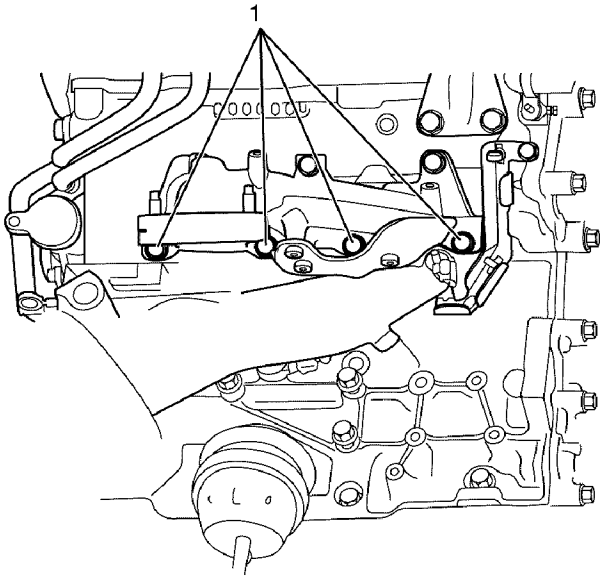
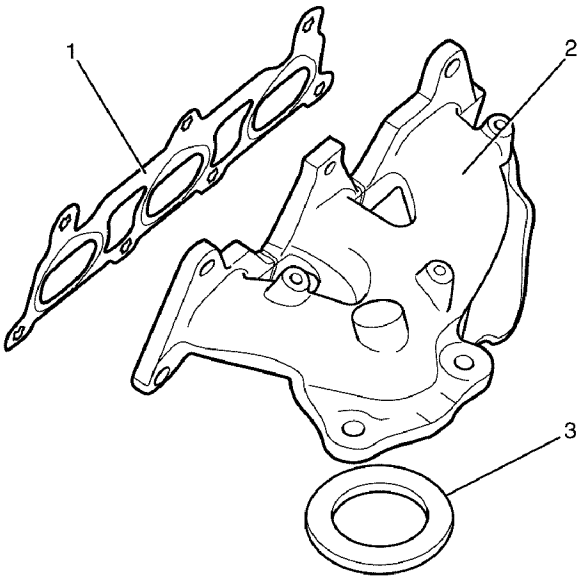
8. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



Note: Bolts with micro-encapsulated thread sealant must be discarded after removal.

9. Remove the exhaust manifold to cylinder head retaining bolts (1).

   Discard the bolts.



Note: Make sure that the surrounding wiring harness and electrical connectors are not damaged when removing the exhaust manifold (2).

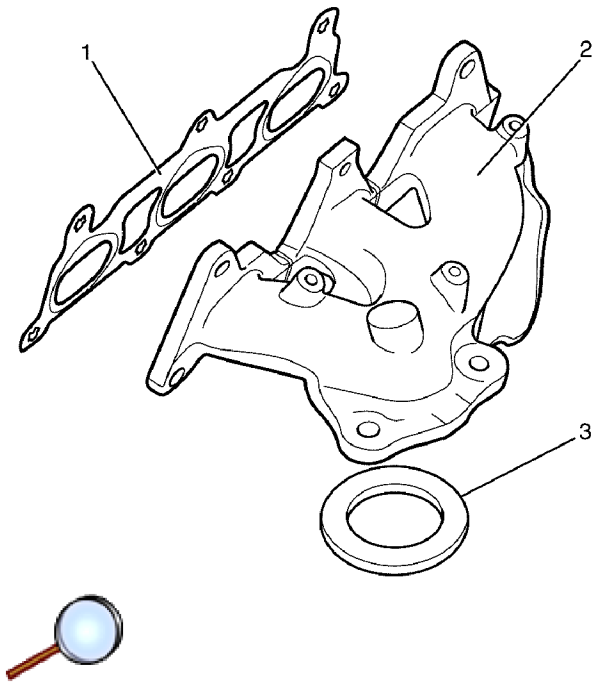
Note: The exhaust manifold gasket (1) and sealing ring (3) are single use parts. They must be discarded after removal.

10. Remove the exhaust manifold (2) from the engine assembly.
11. Separate the exhaust manifold (2) from the exhaust manifold gasket (1) and sealing ring (3).
12. Discard the exhaust manifold gasket (1) and sealing ring (3).

Installation Procedure

Caution: Refer to Exhaust System Inspection Caution in the Preface section.

1. Inspect the exhaust manifold before installation. Refer to Exhaust Manifold Cleaning and Inspection - Right Side.



Note: Make sure the sealing ring is seated correctly.

2. Install a NEW exhaust manifold gasket (1) and NEW sealing ring (3) to the exhaust manifold (2).

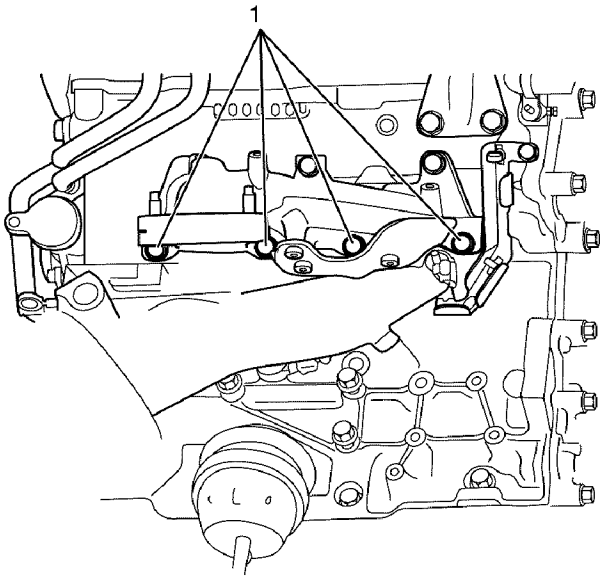
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Note: A suitable support must be used to support the exhaust manifold while the vehicle is being lowered.

4. Install the exhaust manifold assembly (2) to the engine.

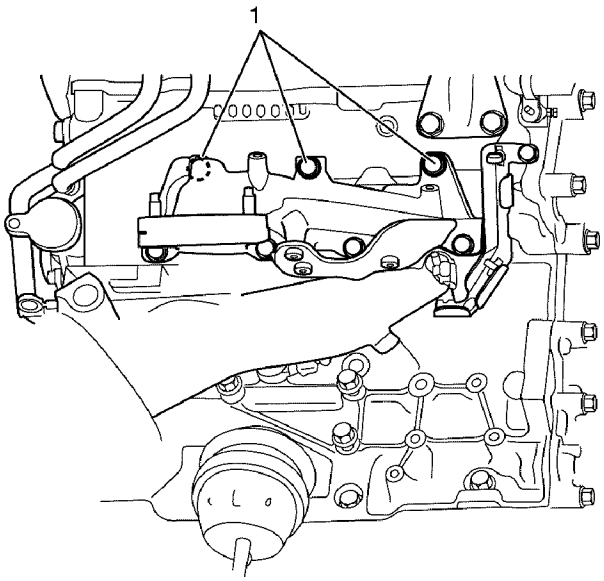


Note: Do not fully tighten the exhaust manifold to cylinder head retaining bolts (1) at this stage.

5. Install NEW exhaust manifold to cylinder head retaining bolts (1).

Caution: Refer to Fastener Caution in the Preface section.

6. Tighten the exhaust manifold to cylinder head retaining bolts (1) working from the centre to the outside to **20 N·m (15 lb ft)**.
7. Lower the vehicle.



Note: Do not fully tighten the exhaust manifold to cylinder head retaining bolts (1) at this

stage.

8. Install NEW exhaust manifold to cylinder head retaining bolts (1).
9. Tighten the exhaust manifold to cylinder head retaining bolts (1) working from the centre to the outside to **20 N·m (15 lb ft)**.
10. Install the right catalytic converter. Refer to Catalytic Converter Replacement - Right Side .
11. Install the exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side .
12. Install the right pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 .
13. Install the engine cover. Refer to Engine Cover Replacement .
14. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Exhaust Crossover Pipe Replacement (V8)

Removal Procedure

Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

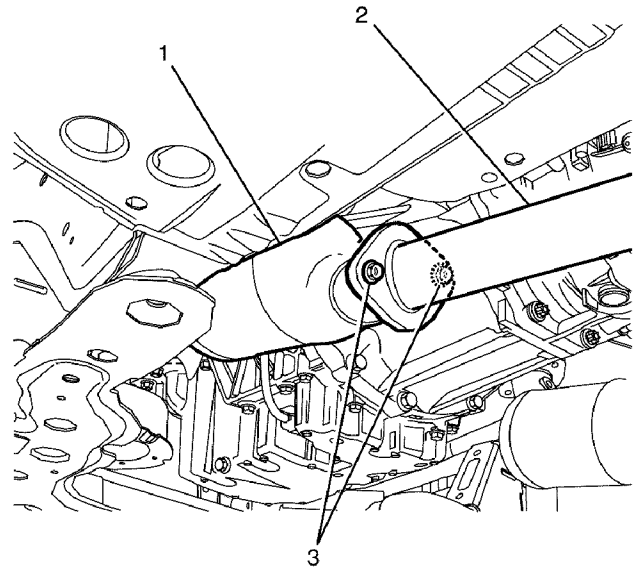
1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Remove the right post-catalytic converter heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
5. Remove the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2.
6. Support the exhaust system using a suitable jack.



Note: The exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

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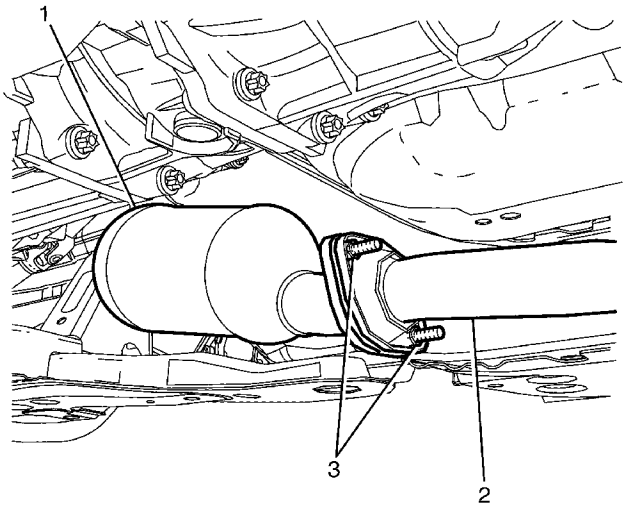
7. Remove the exhaust crossover pipe assembly to left catalytic converter retaining nuts (3).

   Discard the nuts.

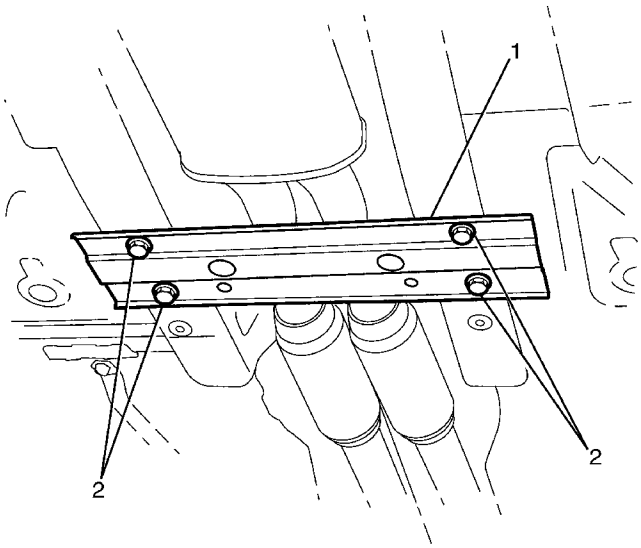


Note: The exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

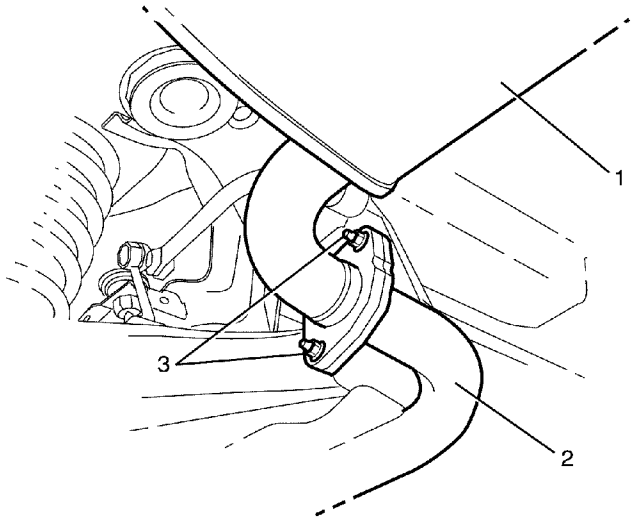
8. Remove the exhaust crossover pipe assembly to right catalytic converter retaining nuts (3).

   Discard the nuts.

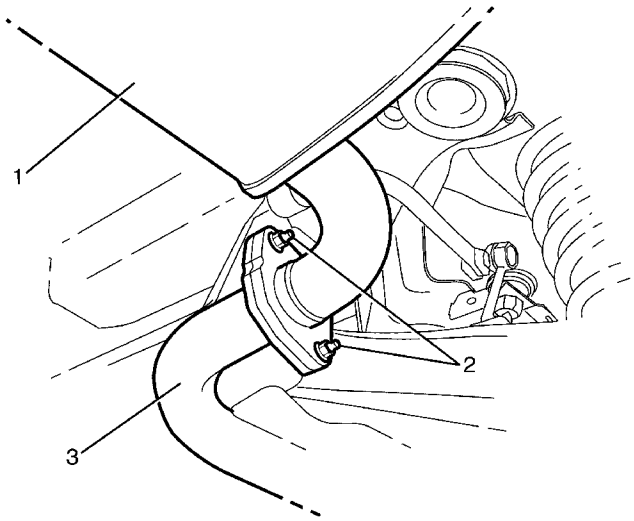
9. Separate the exhaust crossover pipe assembly (2) from the catalytic converter assemblies.



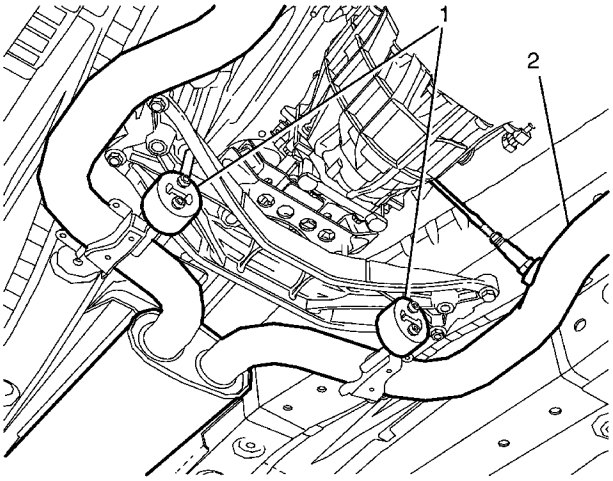
10. Remove the transmission tunnel cross-brace to body retaining bolts (2).
11. Remove the transmission tunnel cross-brace (1).



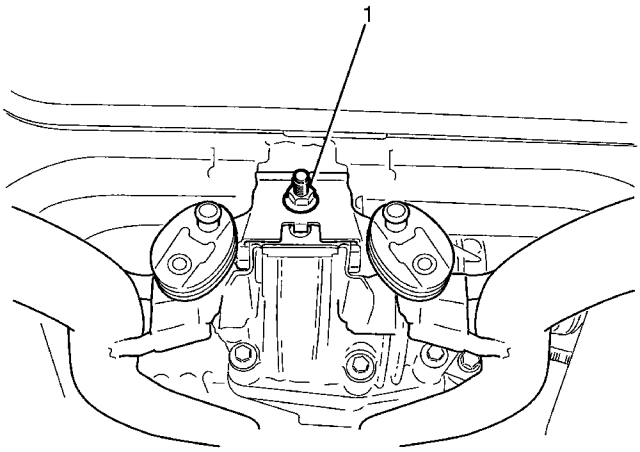
12. Remove the exhaust crossover pipe assembly to left rear muffler retaining bolts (3).
13. Disconnect the left rear muffler (1) from the exhaust crossover pipe assembly (2).



14. Remove the exhaust crossover pipe assembly to right rear muffler retaining bolts (3).
15. Disconnect the right rear muffler (1) from the exhaust crossover pipe assembly (2).



16. Detach the exhaust system (2) by removing the front insulator hangers (1).



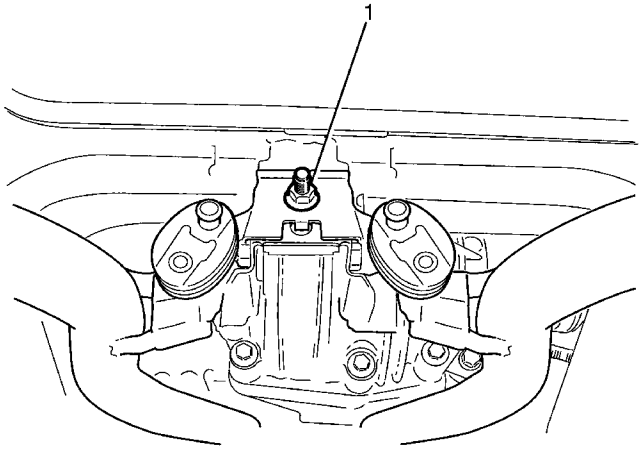
17. Remove the centre insulator hanger bracket to differential retaining nut (1).
18. Detach the exhaust crossover pipe assembly from the centre insulator hanger to differential retaining stud (1).
19. With the aid of an assistant or using a suitable jack; carefully lower the exhaust system from the vehicle.

Installation Procedure

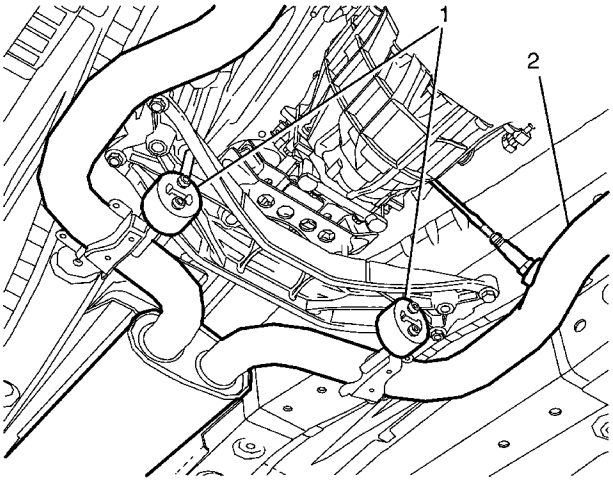
Caution: Refer to Exhaust System Inspection Caution in the Preface section.

1. Clean all threads and flange faces of the exhaust crossover pipe assembly.
2. Replace the catalytic converter to exhaust crossover pipe assembly flange gaskets.

3. With the aid of an assistant or using a suitable jack; position the exhaust crossover pipe assembly to the vehicle.

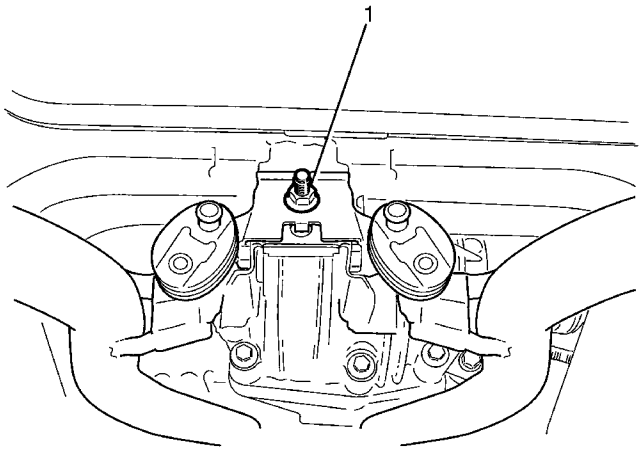


4. Align the exhaust crossover pipe assembly to the centre insulator hanger bracket to differential retaining stud (1).

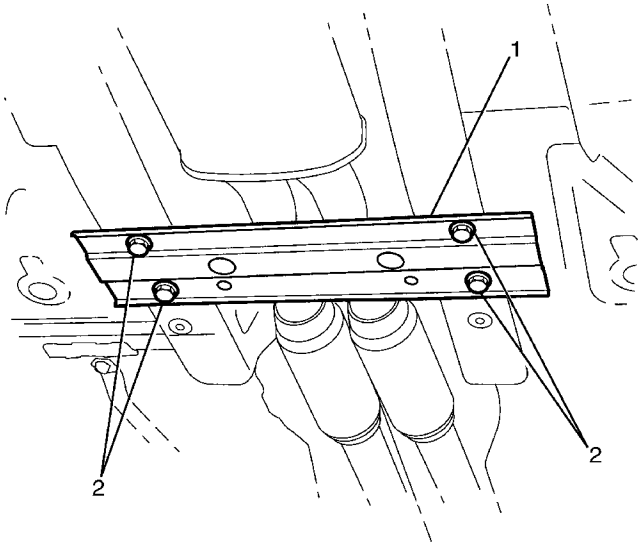


5. Attach the exhaust crossover pipe assembly (2) to the transmission support by installing the front insulator hangers (1), if fitted.

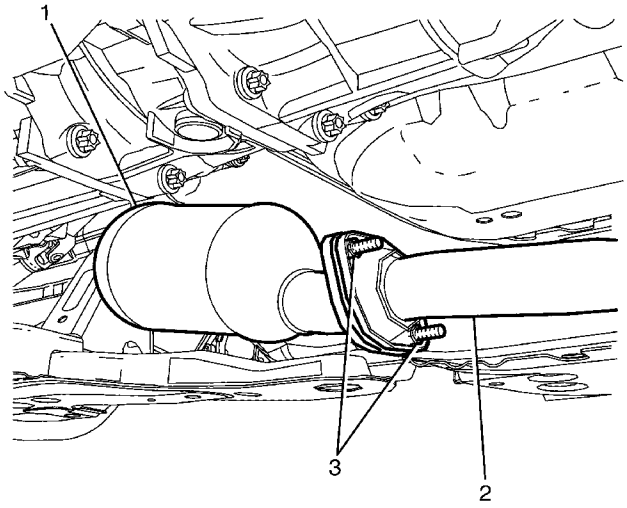
Caution: Refer to Fastener Caution in the Preface section.



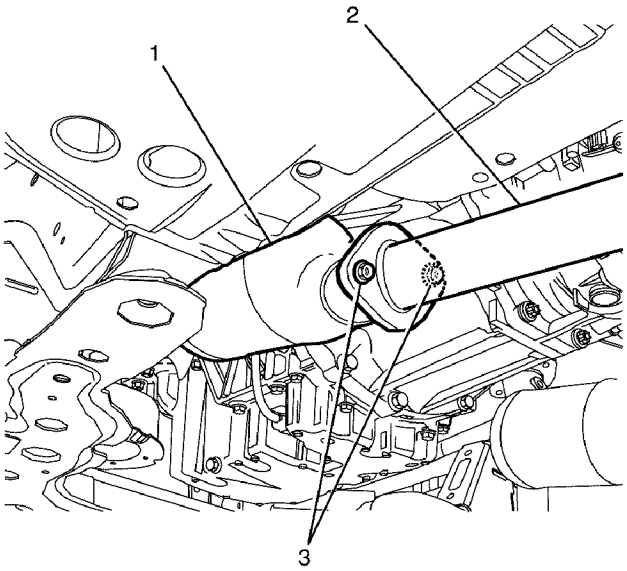
6. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



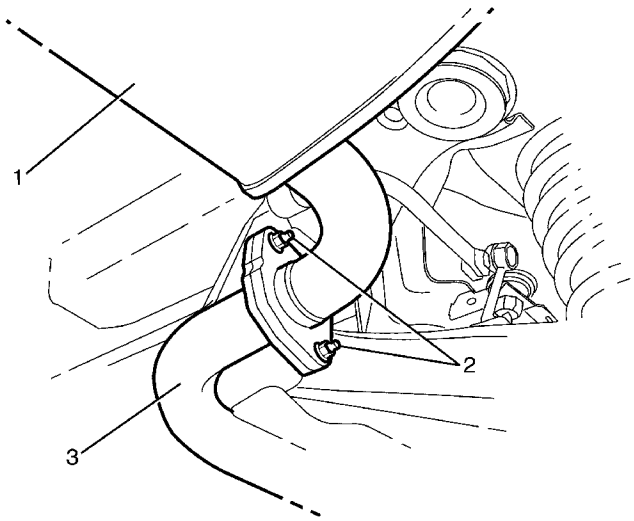
7. Install the transmission tunnel cross-brace (1).
8. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



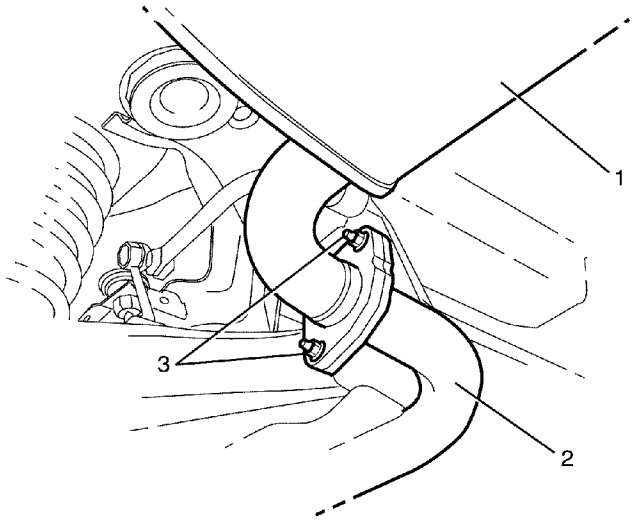
9. Align the exhaust crossover pipe assembly (2) to the right catalytic converter (1).
10. Install the exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



11. Align the exhaust crossover pipe assembly (2) to the left catalytic converter (1).
12. Install the exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



13. Connect the right rear muffler (1) to the exhaust crossover pipe assembly (2).
14. Install the exhaust crossover pipe assembly to right rear muffler retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.



15. Connect the left rear muffler (1) to the exhaust crossover pipe assembly (2).
16. Install the exhaust crossover pipe assembly to left rear muffler retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.
17. Install the right post-catalytic converter heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
18. Install the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2.
19. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
20. Lower the vehicle.

21. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Exhaust Crossover Pipe Replacement (V6)

Removal Procedure

Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

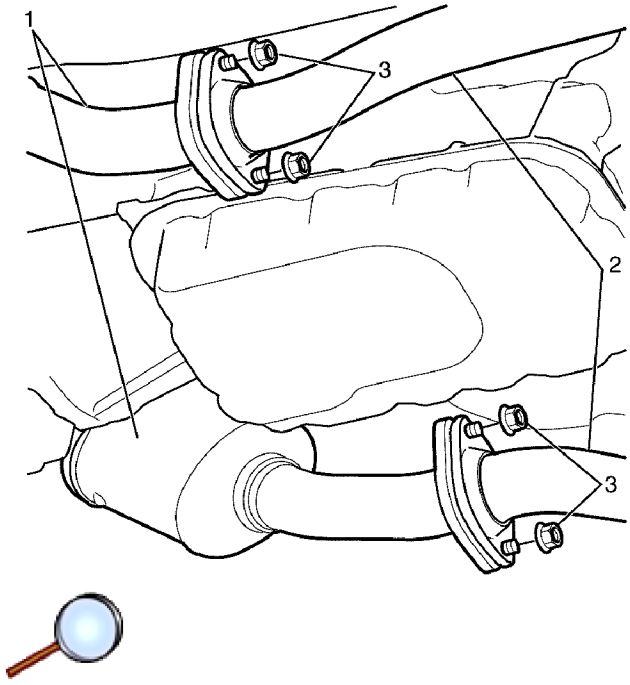
1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Remove the right post-catalytic converter heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
5. Remove the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .



Note: The exhaust crossover pipe assembly to catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

6. Remove exhaust crossover pipe assembly to catalytic converter retaining nuts (3).

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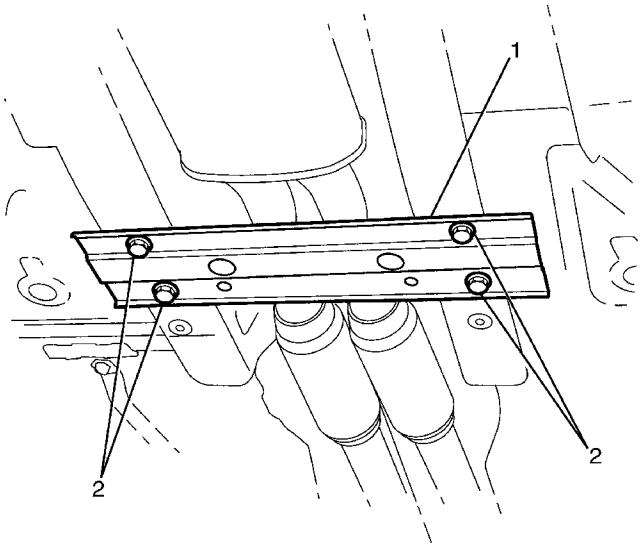
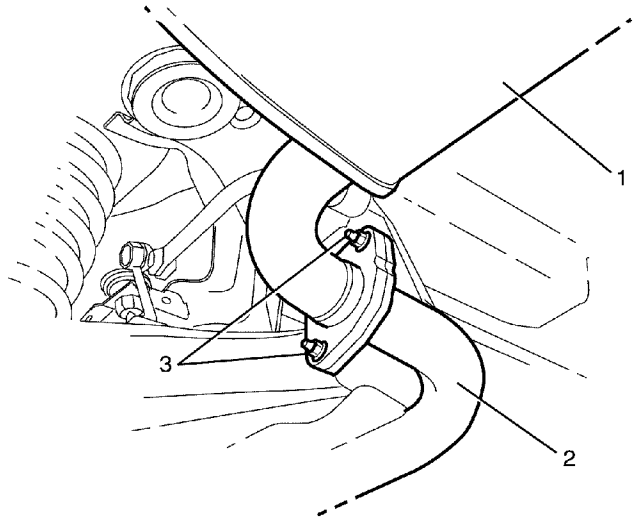
Discard the nuts.

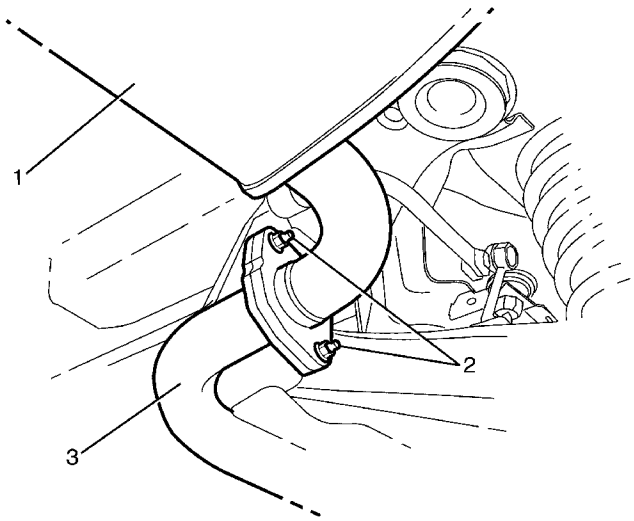
7. Separate the exhaust crossover pipe assembly (2) from the catalytic converter assemblies (1).



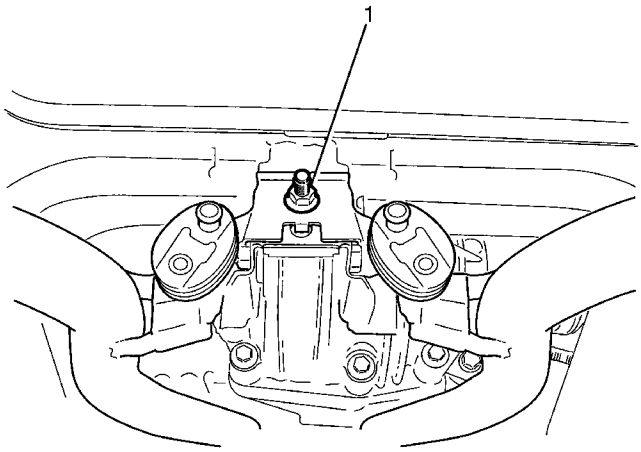
8. Remove the transmission tunnel cross-brace to body retaining bolts (2).
9. Remove the transmission tunnel cross-brace (1).
10. Support the exhaust system with a suitable jack.



11. Remove the exhaust crossover pipe assembly to rear muffler retaining bolts (3)
12. Disconnect the rear left muffler (1) from the exhaust crossover pipe assembly (2)



13. Remove the exhaust crossover pipe assembly to rear muffler retaining bolts (2)
14. Disconnect the rear right muffler (1) from the exhaust crossover pipe assembly (3)

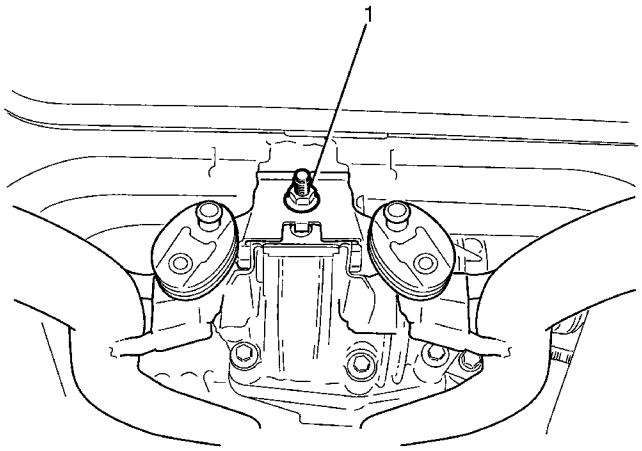


15. Remove the centre insulator hanger bracket to differential retaining nut (1).
16. Detach the exhaust crossover pipe assembly.
17. Carefully lower the exhaust crossover pipe assembly from the vehicle.

Installation Procedure

Caution: Refer to Exhaust System Inspection Caution in the Preface section.

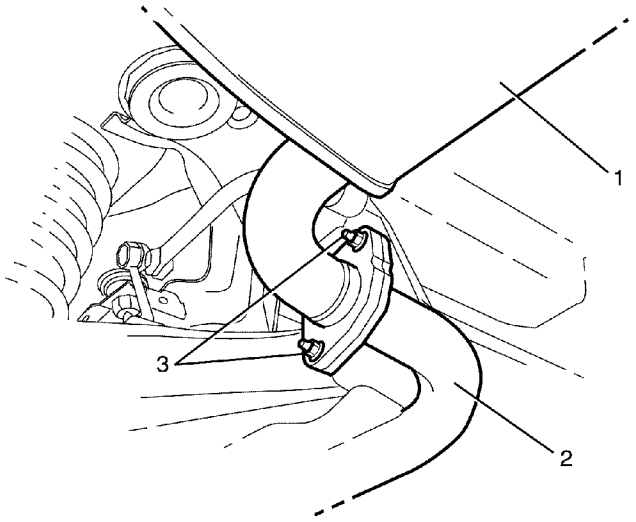
1. Clean all threads and flange faces of the exhaust crossover pipe assembly.
2. Replace the catalytic converter to intermediate pipe flange gaskets.
3. Position the exhaust crossover pipe assembly to the vehicle using a suitable jack.



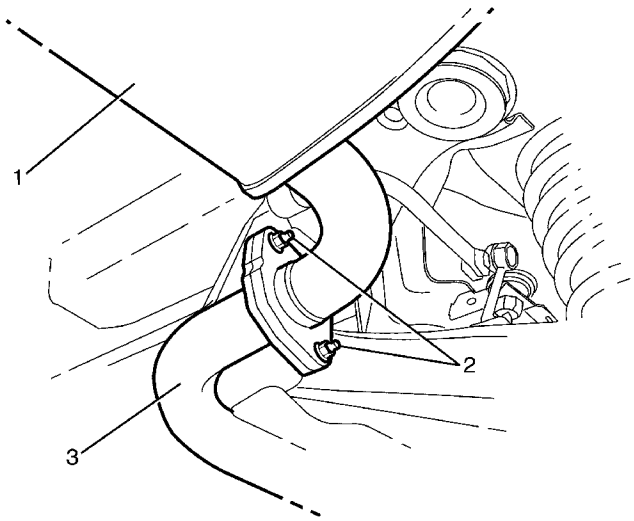
4. Align the exhaust system to the centre insulator hanger bracket to differential retaining bolt.

   Caution: Refer to Fastener Caution in the Preface section.

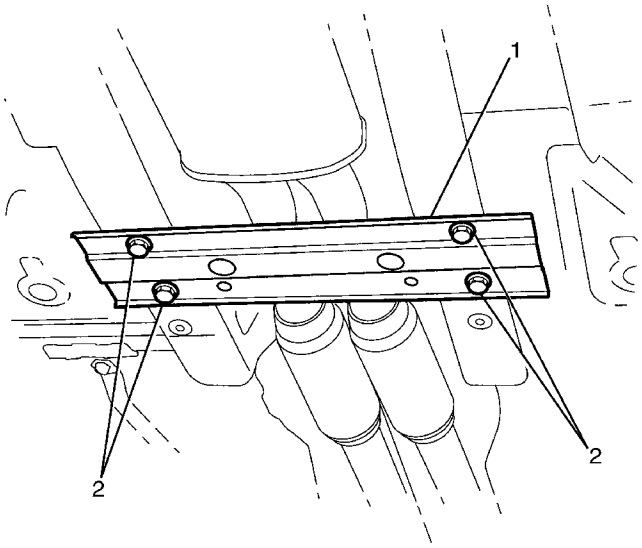
5. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



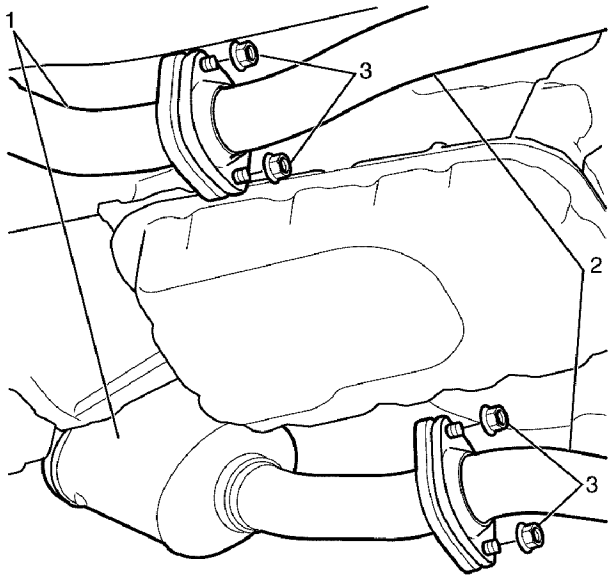
6. Connect the left rear muffler (1) to the exhaust crossover pipe assembly (2).
7. Install the exhaust crossover pipe assembly to left rear muffler retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.



8. Connect the right rear muffler (1) to the exhaust crossover pipe assembly (3).
9. Install the exhaust crossover pipe assembly to right rear muffler retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.



10. Install the transmission tunnel cross-brace (1).
11. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



12. Align the catalytic converter assemblies (1) to the exhaust crossover pipe assembly (2).
13. Install the NEW exhaust crossover pipe assembly to catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.
14. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
15. Install the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
16. Install the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .
17. Lower the vehicle.
18. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Exhaust System Replacement (V8 - For Access)

Removal Procedure

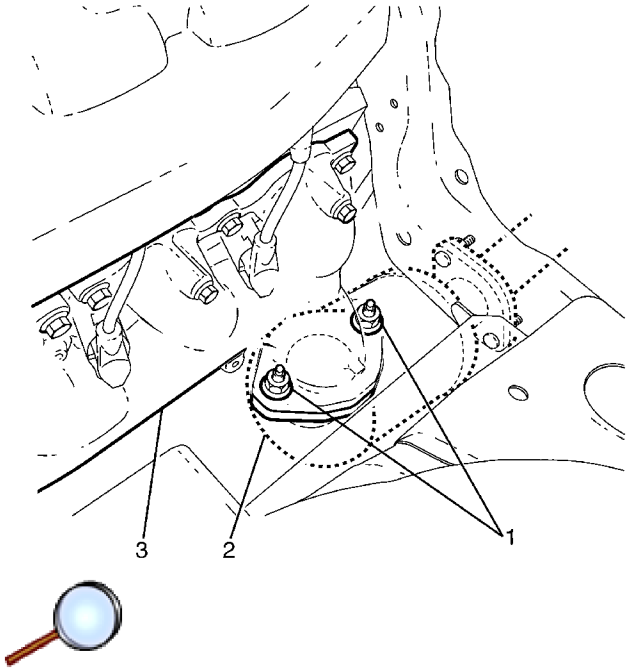
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.



Note: The left catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

3. Remove the left catalytic converter to exhaust manifold retaining nuts (1).

   Discard the nuts.

4. Disconnect the left catalytic converter (2) from the exhaust manifold (3).

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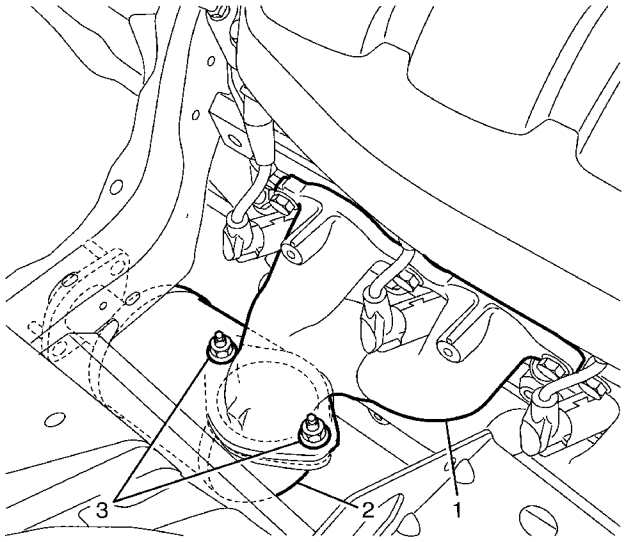


Note: The right catalytic converter to exhaust manifold retaining nuts (3) are single use parts. They must be discarded after removal.

5. Remove the right catalytic converter to exhaust manifold retaining nuts (3).

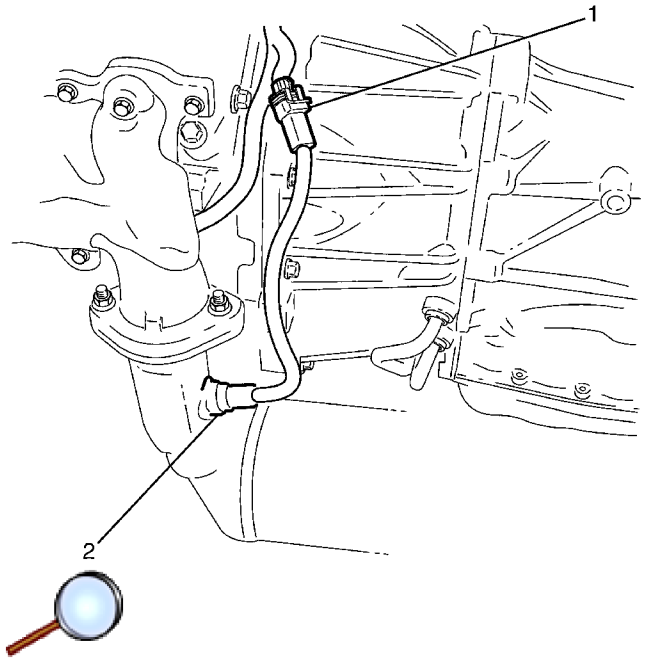
   Discard the nuts.

6. Disconnect the right catalytic converter (2) from the exhaust manifold (1).

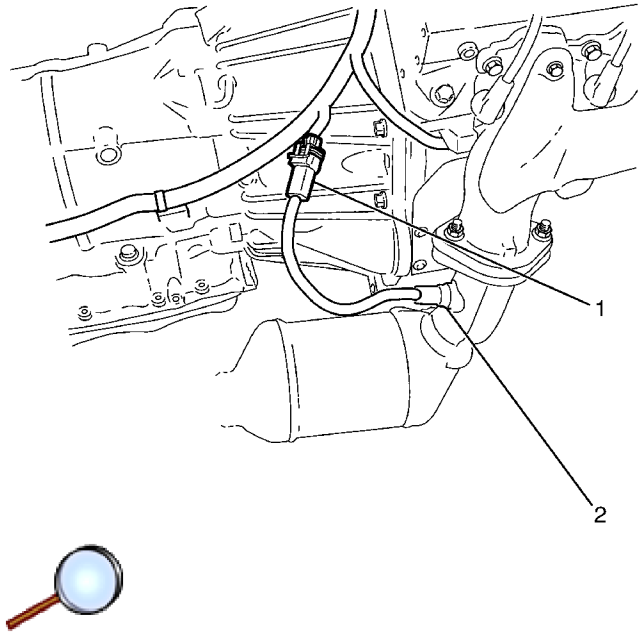
   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

7. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

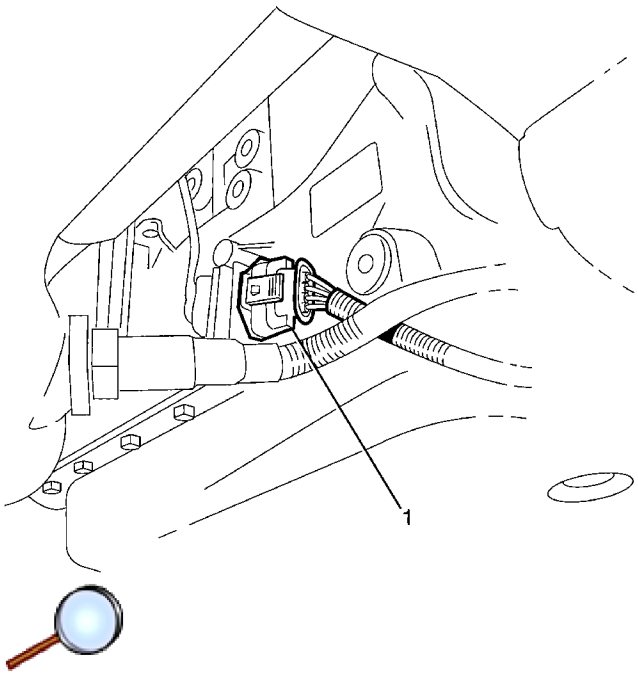
   Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution in the Preface section.



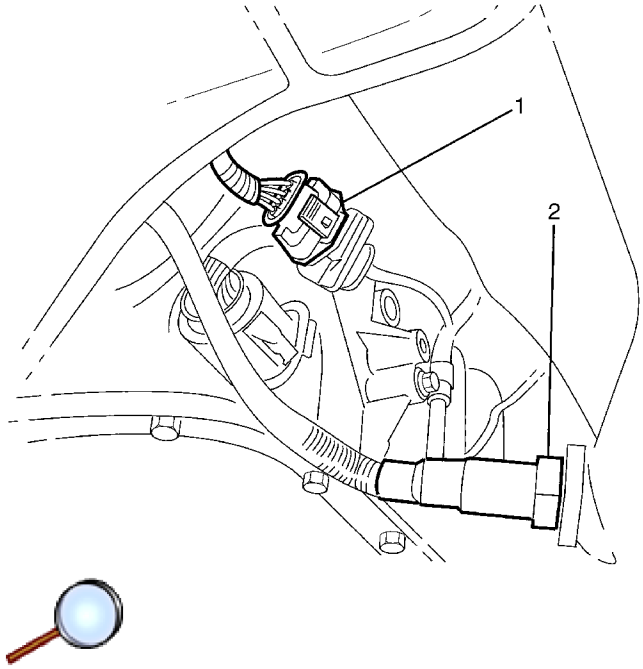
8. Disconnect the left pre-catalytic converter HO2S electrical connector (1).



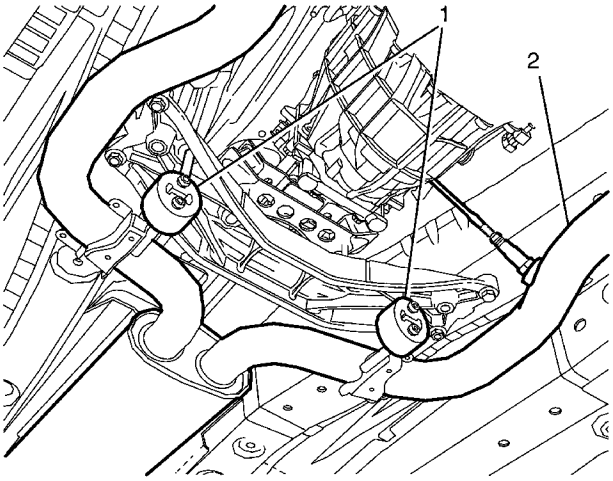
9. Disconnect the right pre-catalytic converter HO2S electrical connector (1).



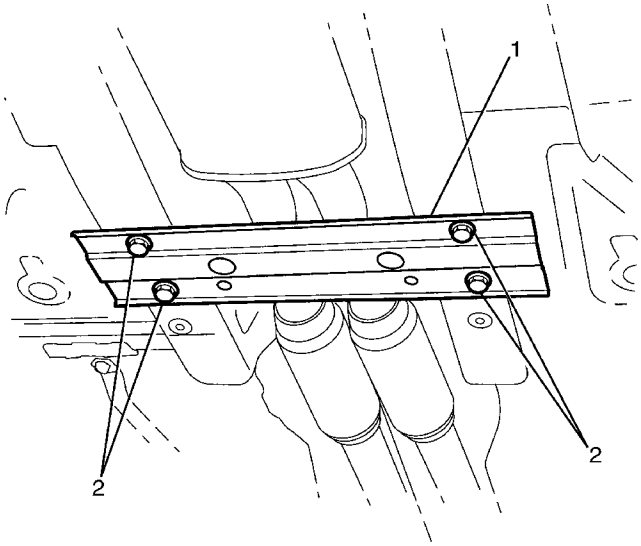
10. Disconnect the left post-catalytic converter HO2S electrical connector (1).



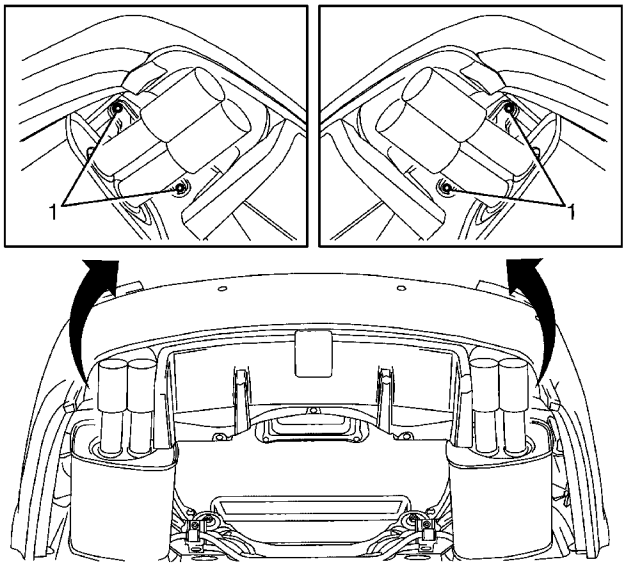
11. Disconnect the right post-catalytic converter HO2S electrical connector (1).



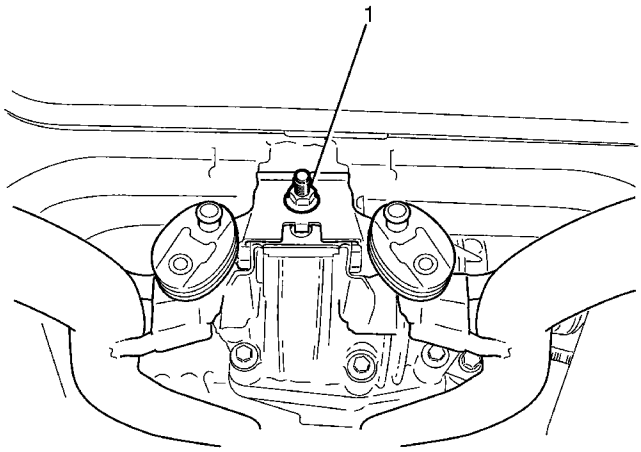
12. Detach the exhaust system (2) by removing the front insulator hangers (1).
13. Support the exhaust system with a suitable jack.



14. Remove the transmission tunnel cross-brace to body retaining bolts (2).
15. Remove the transmission tunnel cross-brace (1).



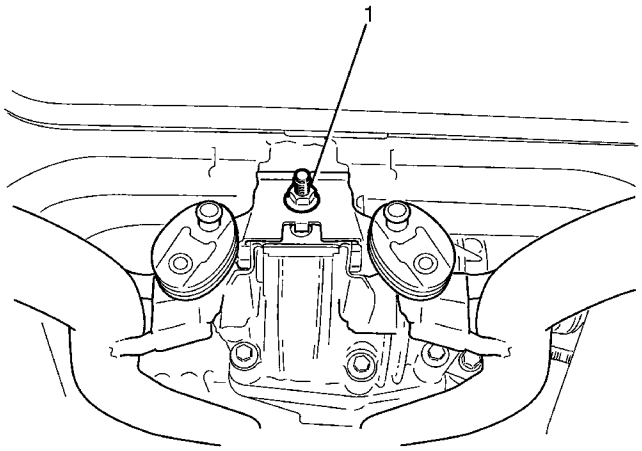
16. Remove the rear insulator hanger to body retaining bolts (1).



17. Remove the centre insulator hanger bracket to differential retaining nut (1).
18. Detach the exhaust system assembly from the centre insulator hanger bracket to differential retaining stud (1).
19. With the aid of an assistant or using a suitable jack; carefully lower the exhaust system from the vehicle.

Installation Procedure

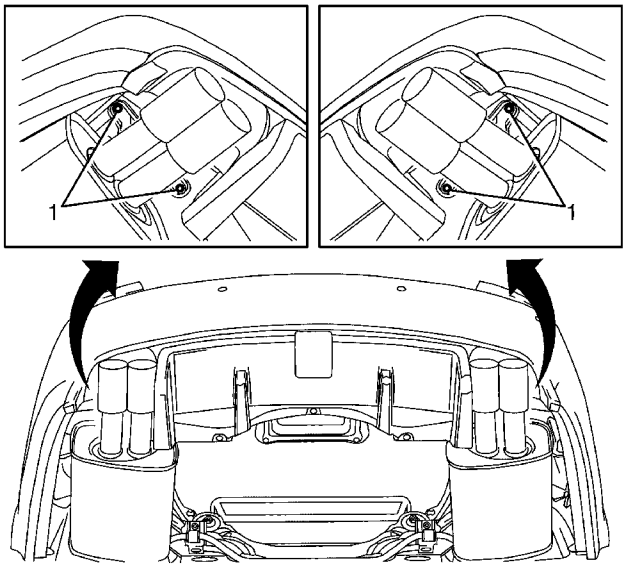
1. With the aid of an assistant or using a suitable jack; carefully raise the exhaust system to the vehicle.



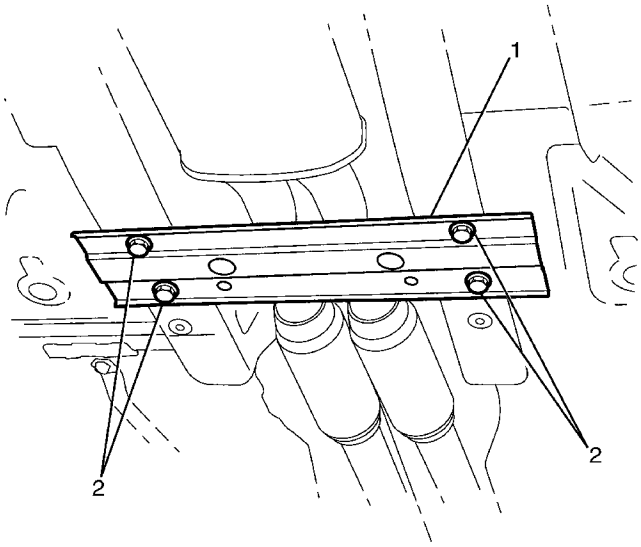
2. Align the exhaust system to the centre insulator hanger bracket to differential retaining stud (1).

Caution: Refer to Fastener Caution in the Preface section.

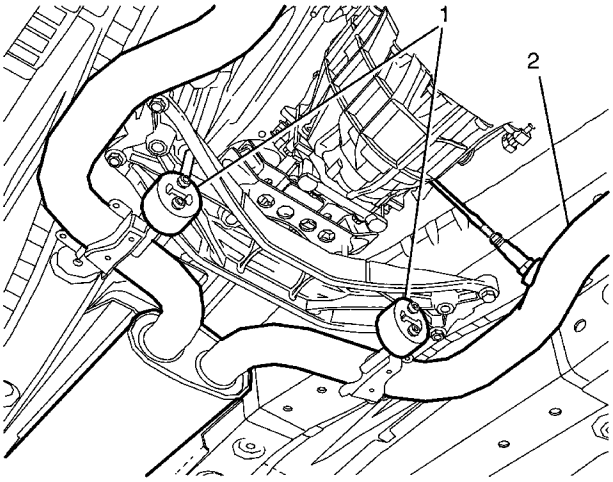
3. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



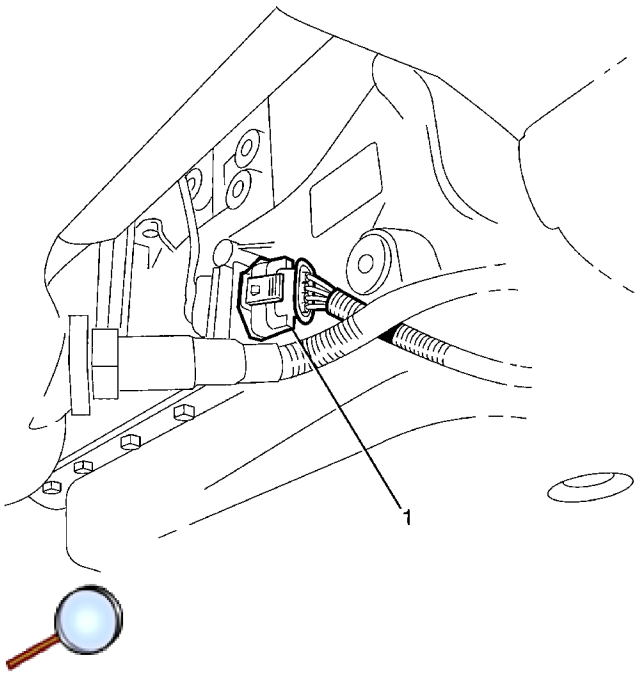
4. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.



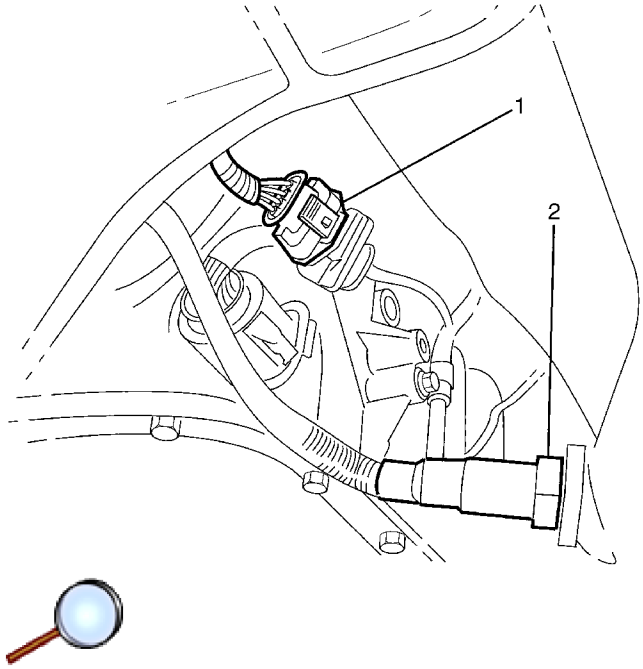
5. Install the transmission tunnel cross-brace (1).
6. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



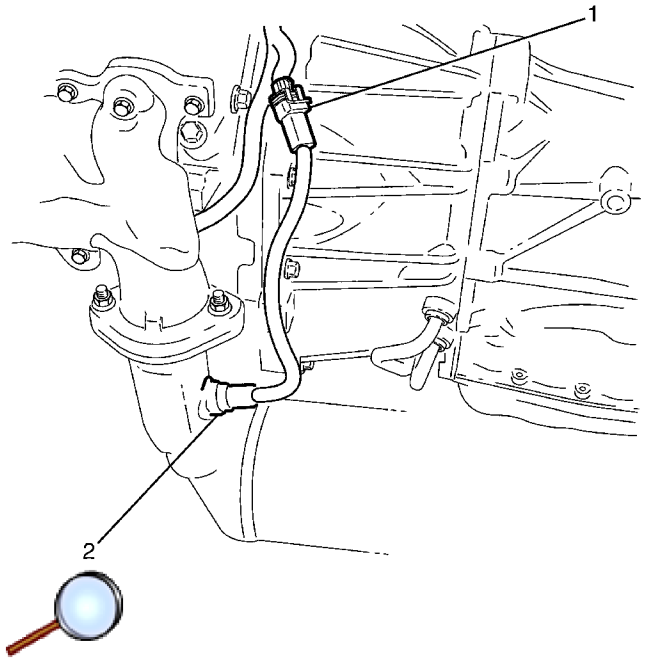
7. Align the exhaust system (2) to the front hanger studs and install the front insulator hangers (1).
8. Remove the jack supporting the exhaust system.



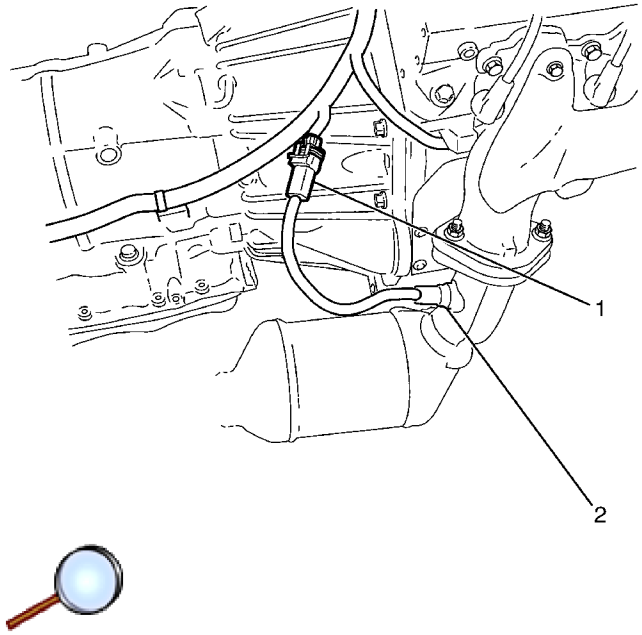
9. Connect the left post-catalytic converter HO2S electrical connector (1).



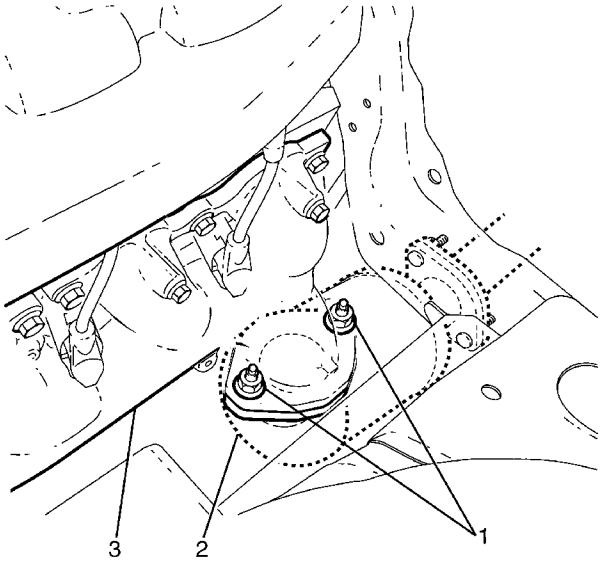
10. Connect the right post-catalytic converter HO2S electrical connector (1).



11. Connect the left pre-catalytic converter HO2S electrical connector (1).



12. Connect the right pre-catalytic converter HO2S electrical connector (2).



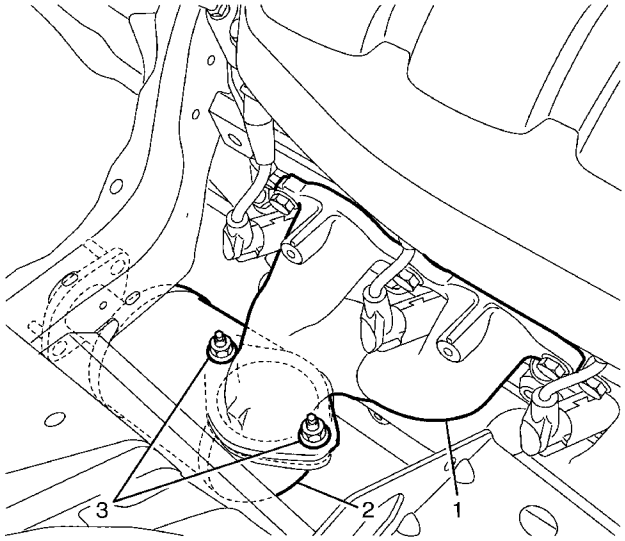
Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

13. Push up and forward on the left catalytic converter (2) to connect to the exhaust manifold (3).

Note: Do not fully tighten the left catalytic converter to exhaust manifold retaining nuts (1) at this stage.

14. Install the NEW left catalytic converter to exhaust manifold retaining nuts (1).

Do not fully tighten at this stage.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

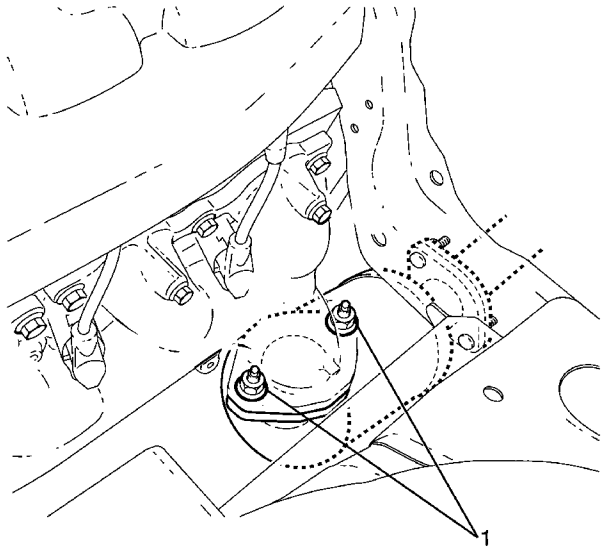
15. Push up and forward on the right catalytic converter (2) to connect to the exhaust manifold (1).

Note: Do not fully tighten the right catalytic converter to exhaust manifold retaining nuts (3) at this stage.

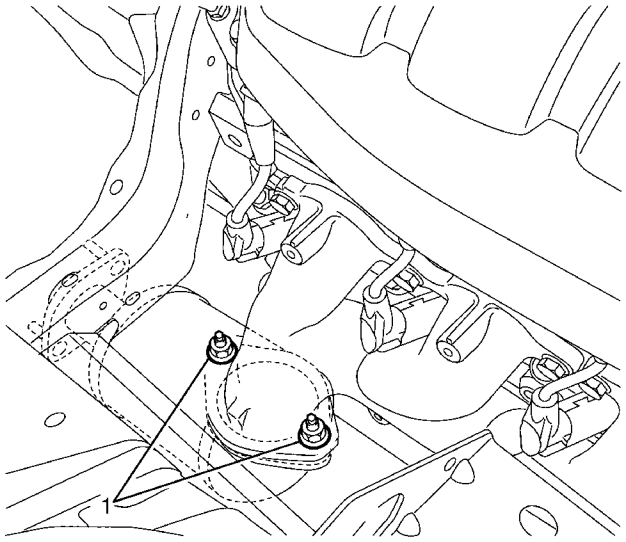
16. Install the NEW right catalytic converter to exhaust manifold retaining nuts (3).

Do not fully tighten at this stage.

17. Lower the vehicle.



18. Tighten the left catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.



19. Tighten the right catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.
20. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
21. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Exhaust System Replacement (V8 - Complete)

Removal Procedure

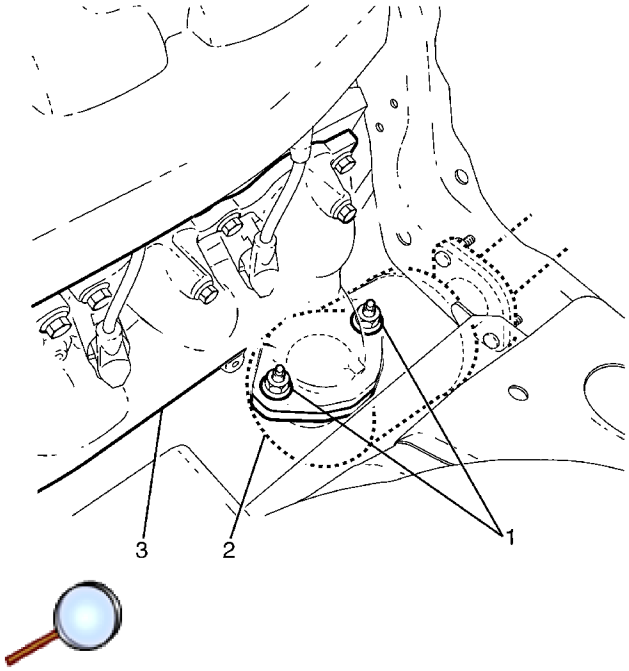
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.



   Note: The left catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

3. Remove the left catalytic converter to exhaust manifold retaining nuts (1).

   Discard the nuts.

4. Disconnect the left catalytic converter (2) from the exhaust manifold (3).

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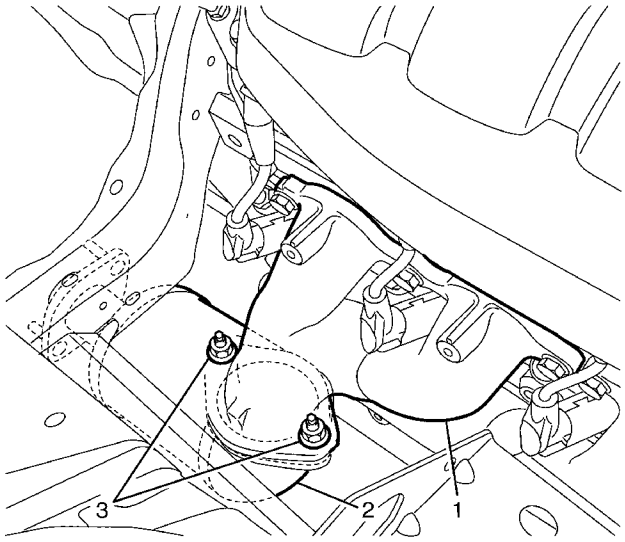


Note: The right catalytic converter to exhaust manifold retaining nuts (3) are single use parts. They must be discarded after removal.

5. Remove the right catalytic converter to exhaust manifold retaining nuts (3).

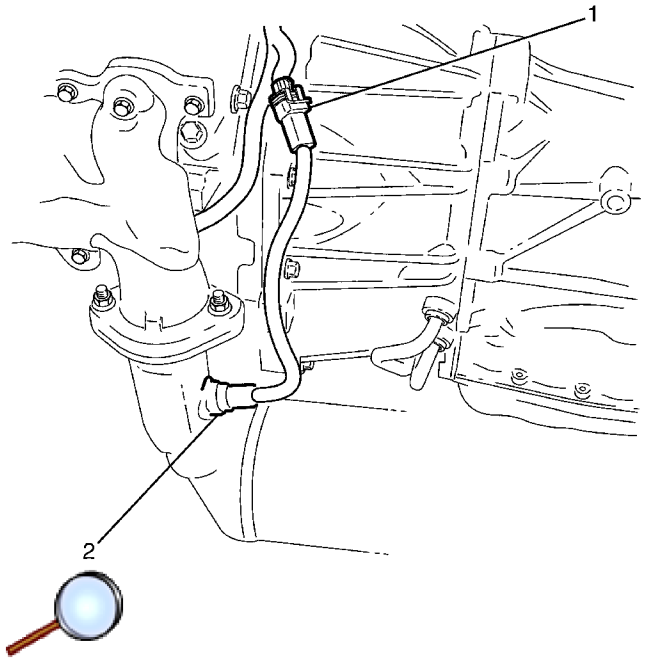
   Discard the nuts.

6. Disconnect the right catalytic converter (2) from the exhaust manifold (1).

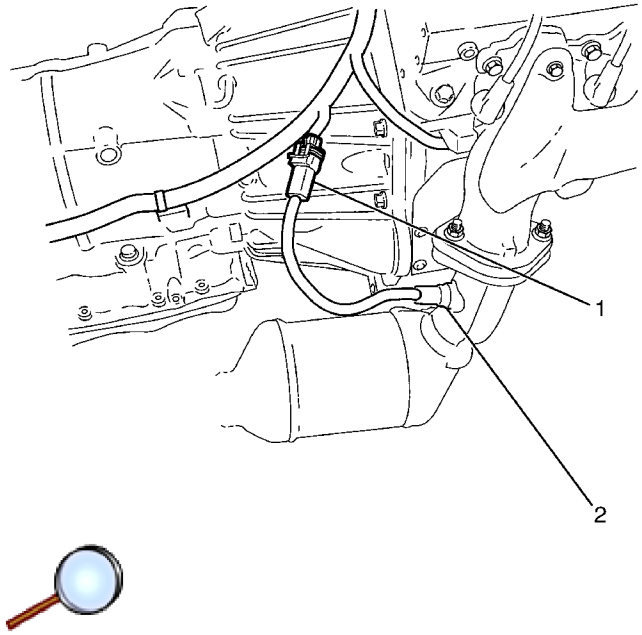
   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

7. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

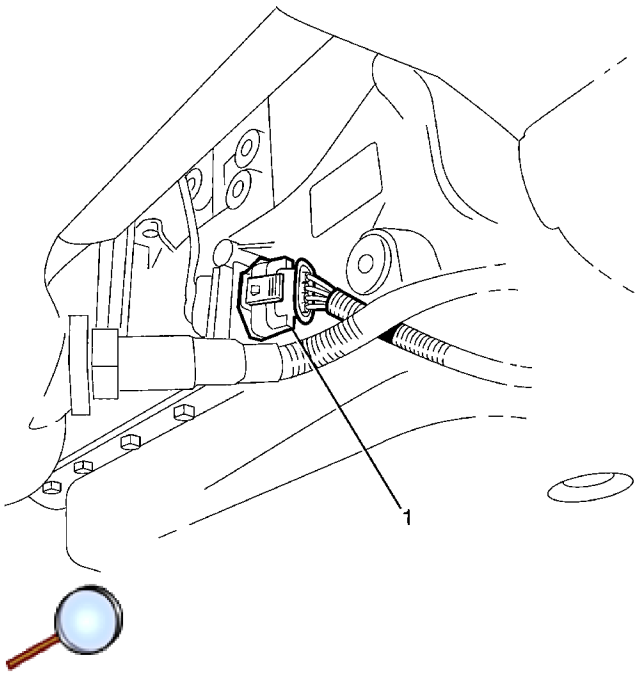
   Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution in the Preface section.



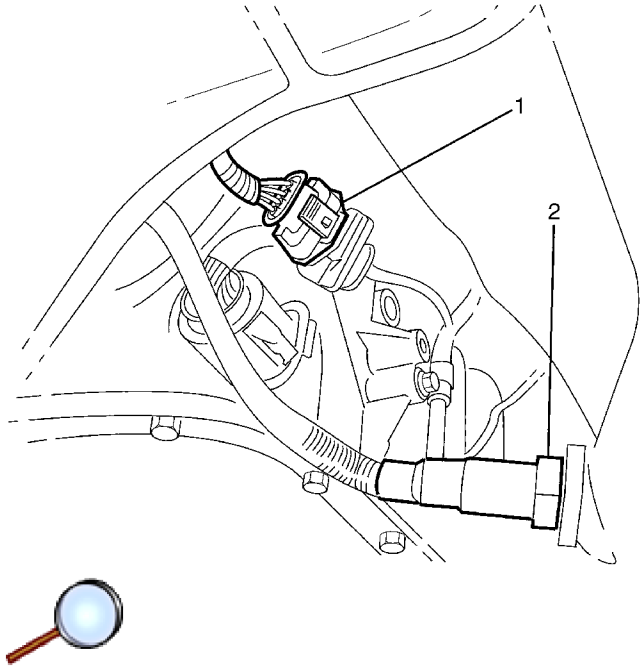
8. Disconnect the left pre-catalytic converter HO2S electrical connector (1).



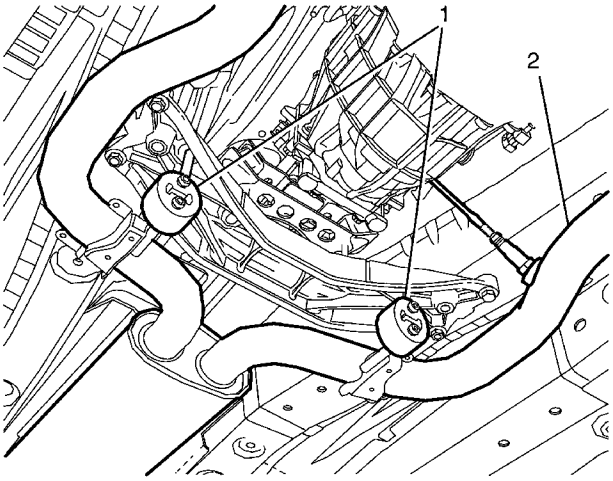
9. Disconnect the right pre-catalytic converter HO2S electrical connector (1).



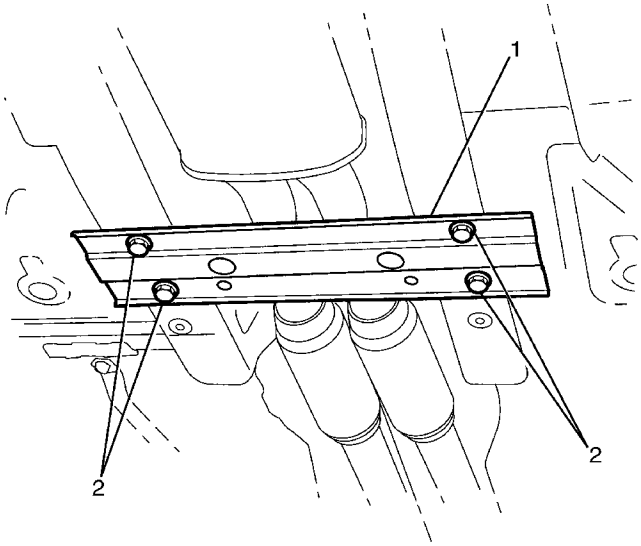
10. Disconnect the left post-catalytic converter HO2S electrical connector (1).



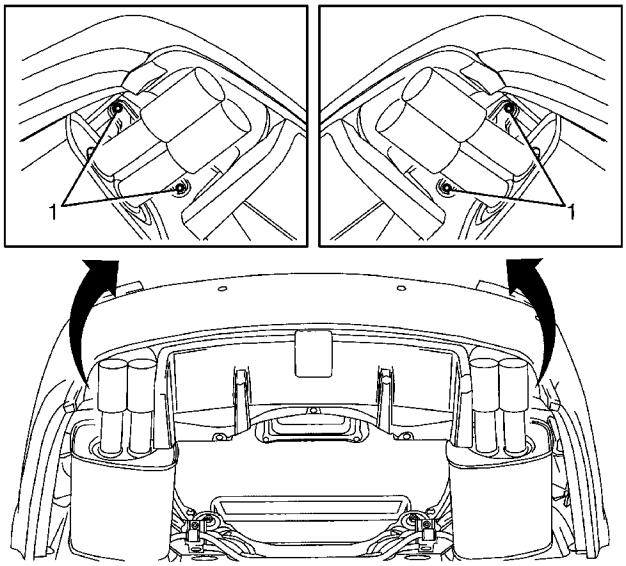
11. Disconnect the right post-catalytic converter HO2S electrical connector (1).



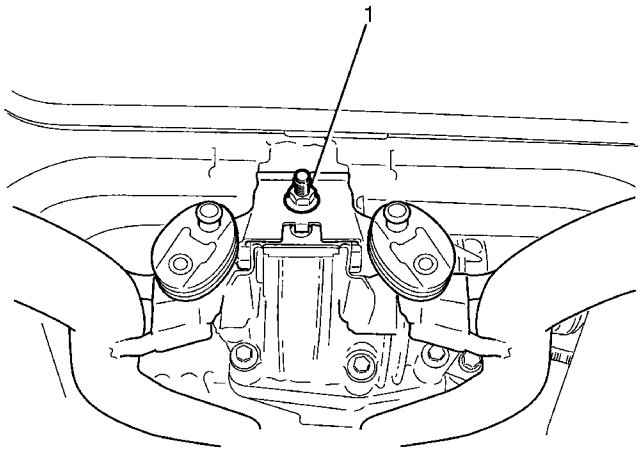
12. Detach the exhaust system (2) by removing the front insulator hangers (1).
13. Support the exhaust system with a suitable jack.



14. Remove the transmission tunnel cross-brace to body retaining bolts (2).
15. Remove the transmission tunnel cross-brace (1).



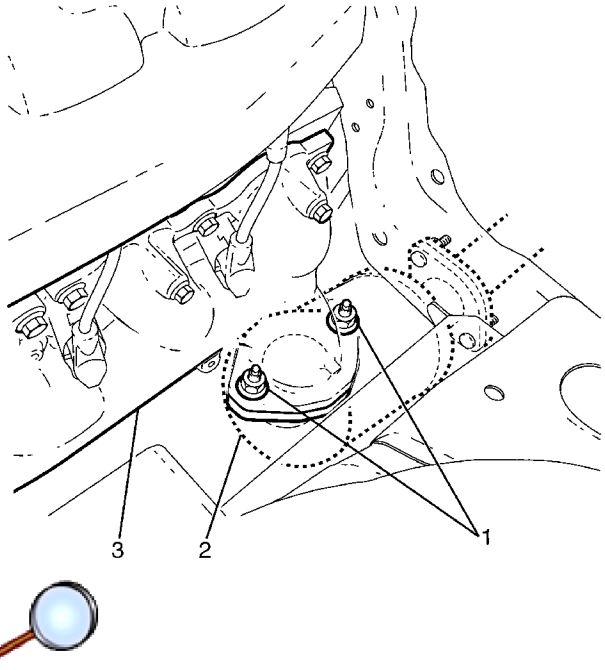
16. Remove the rear insulator hanger to body retaining bolts (1).



17. Remove the centre insulator hanger bracket to differential retaining nut (1).
18. Detach the exhaust system assembly from the centre insulator hanger bracket to differential retaining stud (1).
19. With the aid of an assistant or using a suitable jack; carefully lower the exhaust system from the vehicle.
20. Remove the left pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.
21. Remove the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2.
22. Remove the right pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
23. Remove the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.

Installation Procedure

1. Install the left pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

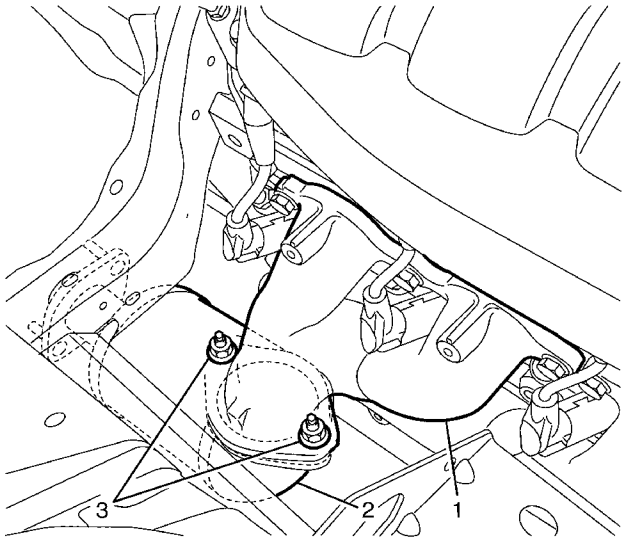
2. From underneath the vehicle, position the left catalytic converter (2) to the exhaust manifold (3).

Note: Do not fully tighten the left catalytic converter to exhaust manifold retaining nuts (1) at this stage.

3. Install the NEW left catalytic converter to exhaust manifold retaining nuts (1).

Do not fully tighten at this stage.

4. Install the right pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

5. From underneath the vehicle, position the right catalytic converter (2) to the exhaust manifold (1).

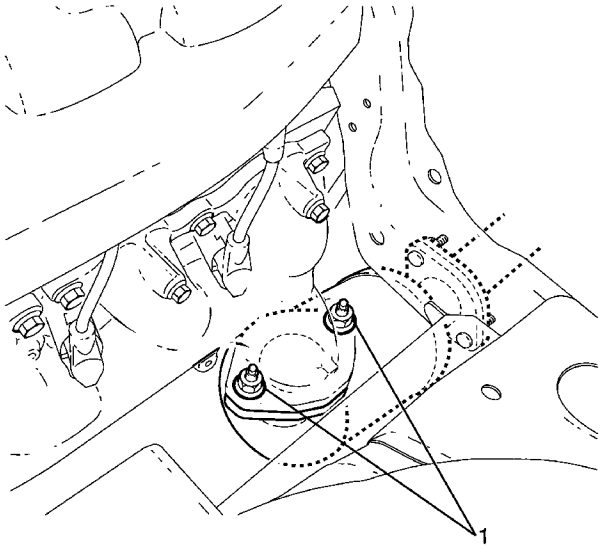
   Note: Do not fully tighten the right catalytic converter to exhaust manifold retaining nuts (3) at this stage.

6. Install the NEW right catalytic converter to exhaust manifold retaining nuts (3).

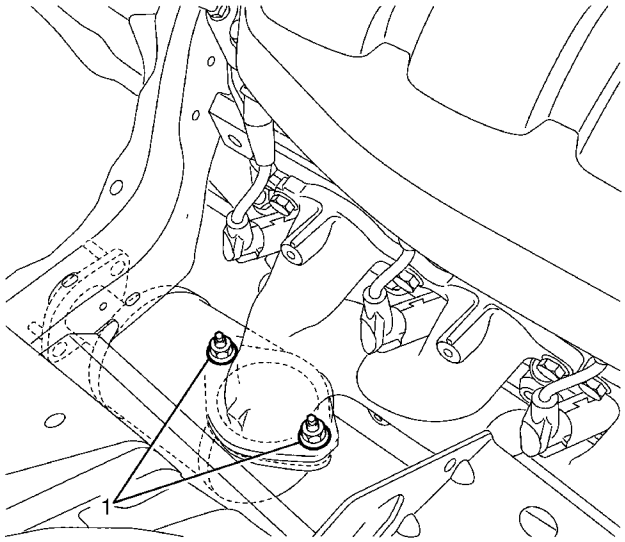
   Do not fully tighten at this stage.

7. Lower the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.



8. Tighten the left catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.

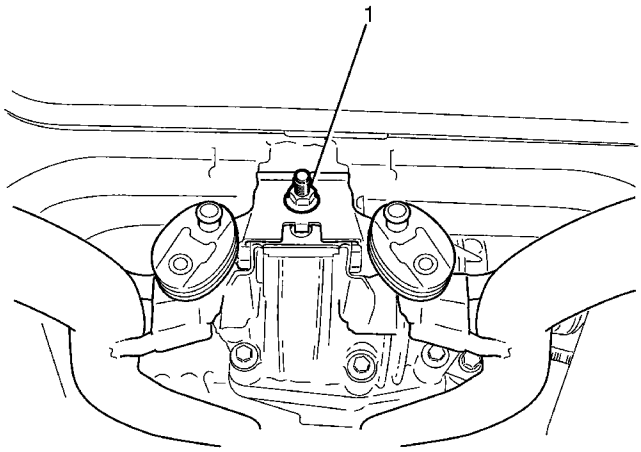


9. Tighten the right catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.

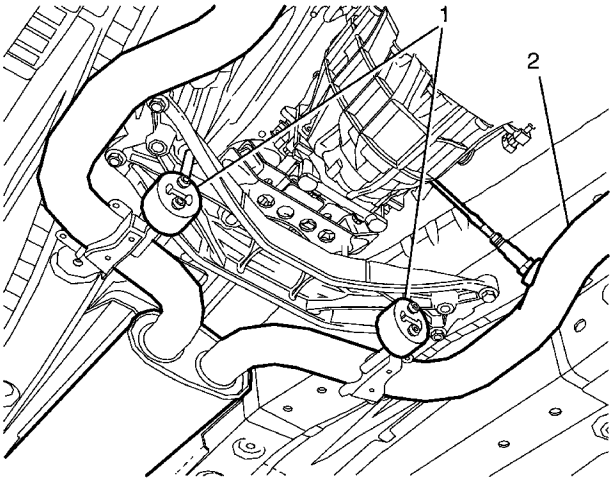
Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

10. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
11. Install the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2.

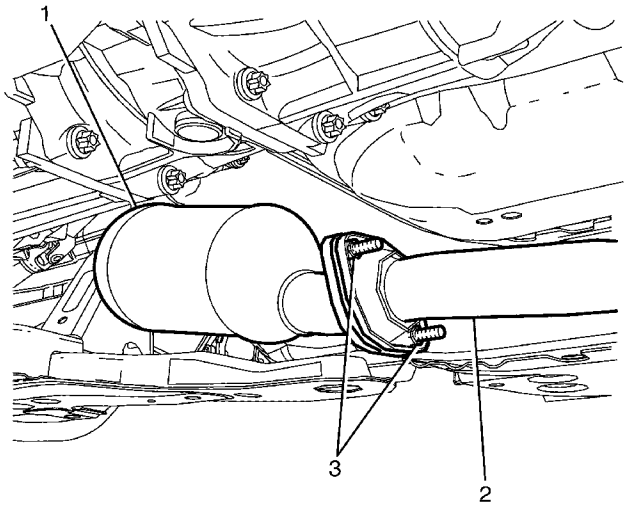
12. Install the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
13. With the aid of an assistant, or using a suitable jack; position the exhaust crossover pipe assembly to the vehicle.



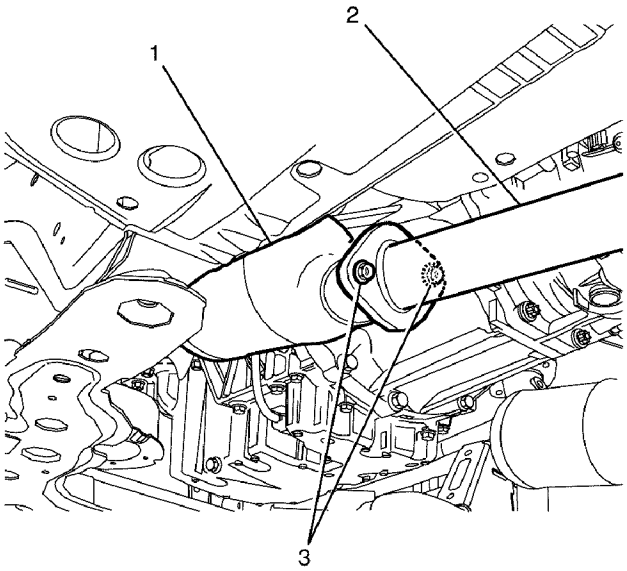
14. Align the exhaust system to the centre insulator hanger bracket to differential retaining stud (1).



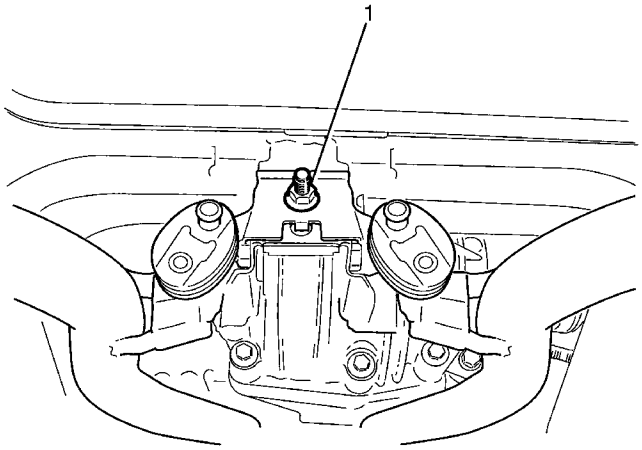
15. Align the exhaust system (2) to the front hanger studs and install the front insulator hangers (1).
16. Remove the jack supporting the exhaust system.



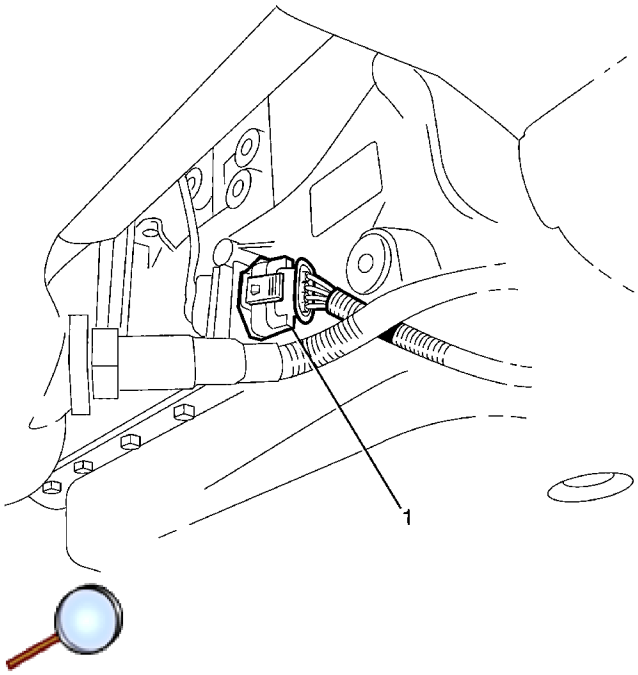
17. Align the exhaust crossover pipe exhaust assembly (2) to the right catalytic converter (1).
18. Install the intermediate exhaust assembly to right catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



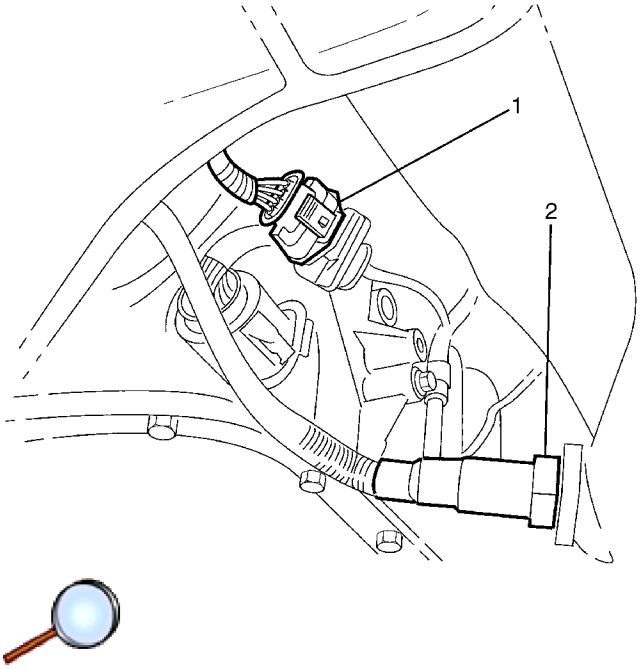
19. Align the exhaust crossover pipe exhaust assembly (2) to the left catalytic converter (1).
20. Install the intermediate exhaust assembly to left catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



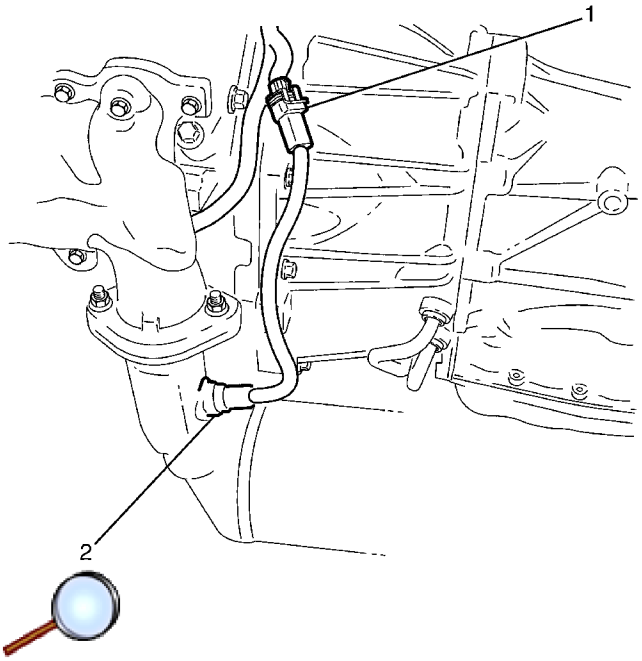
21. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



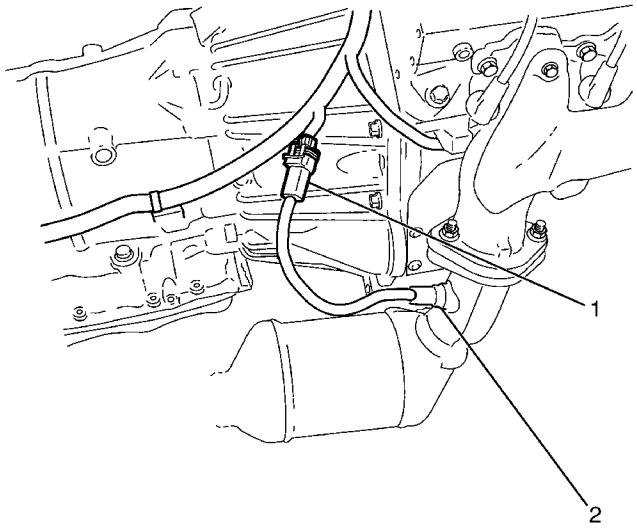
22. Connect the left post-catalytic converter HO2S electrical connector (1).



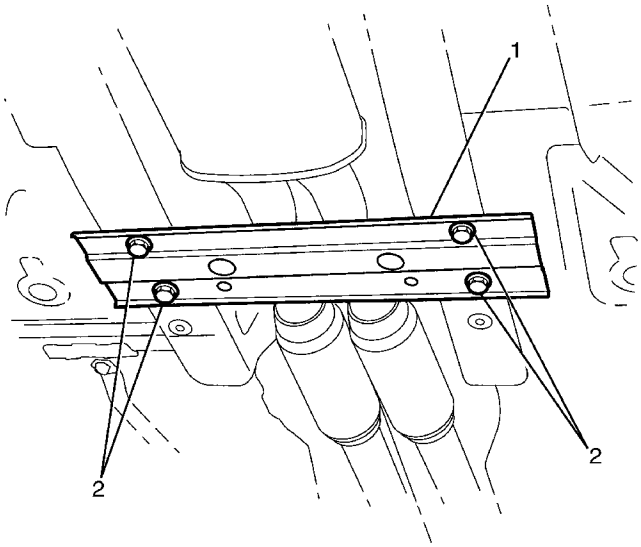
23. Connect the right post-catalytic converter HO2S electrical connector (1).



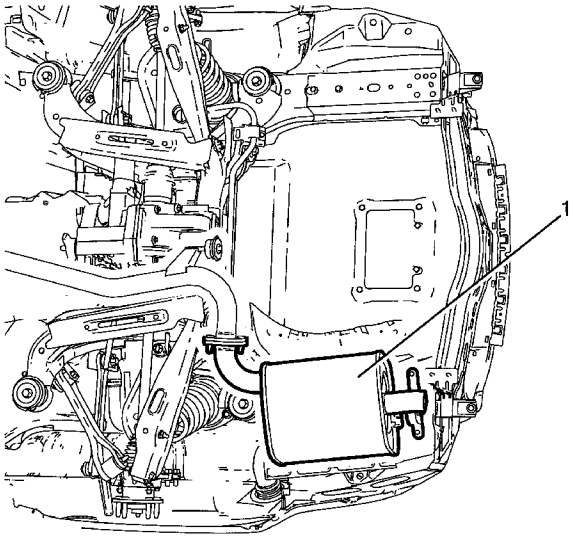
24. Connect the left pre-catalytic converter HO2S electrical connector (1).



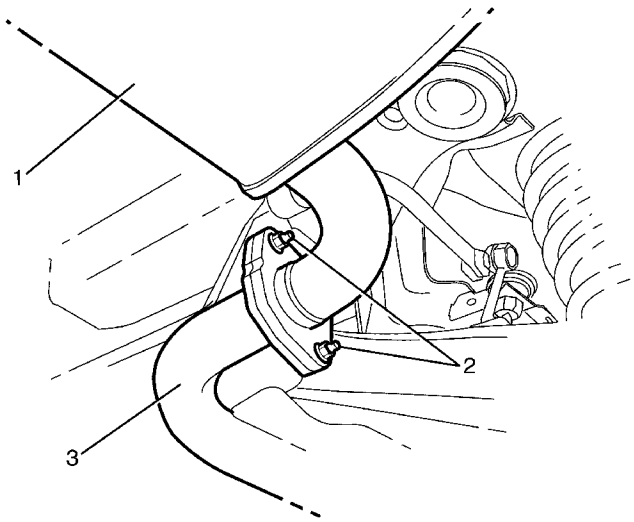
25. Connect the right pre-catalytic converter HO2S electrical connector (2).



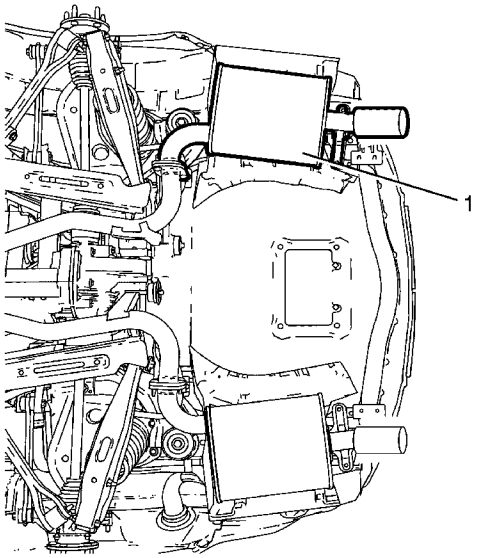
26. Install the transmission tunnel cross-brace (1).
27. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



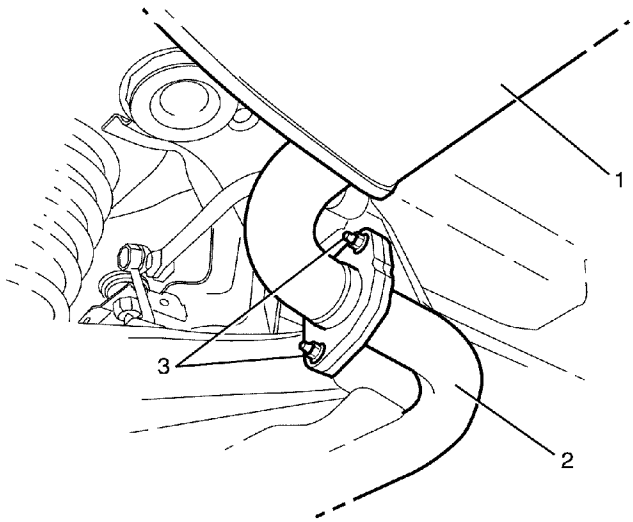
28. Install the right rear muffler (1) to the vehicle.



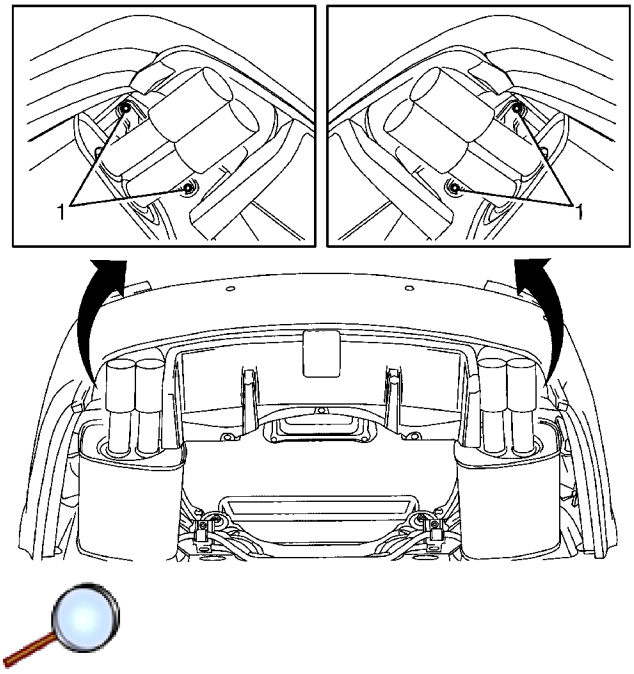
29. Connect the right rear muffler (1) to the exhaust crossover pipe assembly (2).
30. Install the right rear muffler to exhaust crossover pipe assembly retaining bolts (2) and tighten to **45 N·m (33 lb ft)**.



31. Install the left rear muffler (1) to the vehicle.



32. Connect the left rear muffler (1) to the exhaust crossover pipe assembly (2).
33. Install the left rear muffler to exhaust crossover assembly retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.



34. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.
35. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
36. Lower the vehicle.
37. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Exhaust System Replacement (V6 - For Access)

Removal Procedure

Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

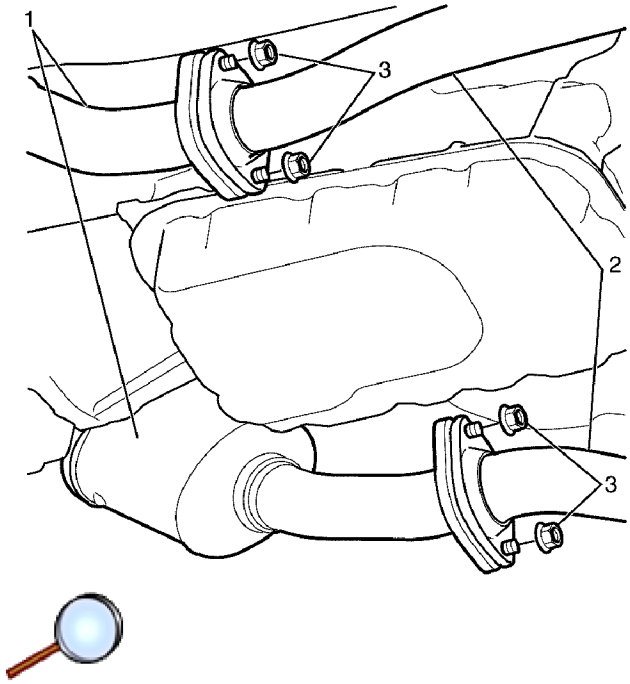
2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Caution: Refer to Heated Oxygen and Oxygen Sensor Caution in the Preface section.

4. Remove the right post-catalytic converter heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
5. Remove the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2.



6. Remove the exhaust crossover pipe assembly to catalytic converter retaining nuts (3).
7. Separate the exhaust crossover pipe assembly (2) from the catalytic converter assemblies (1).

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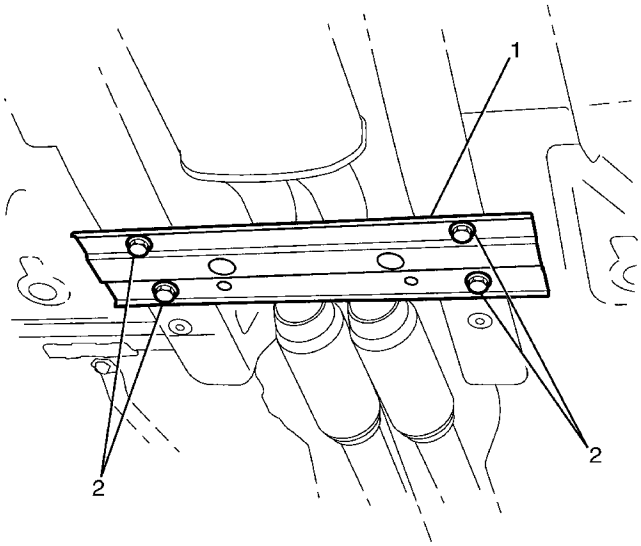
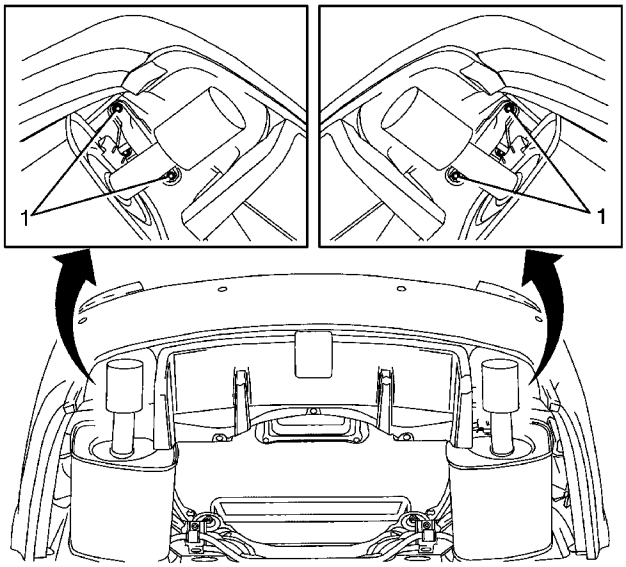
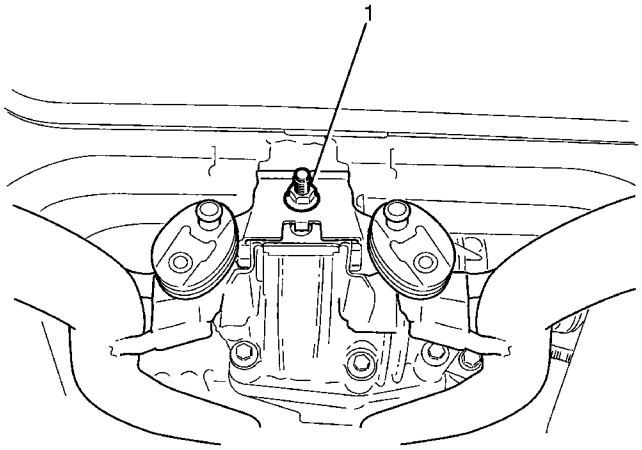


8. Remove the transmission tunnel cross-brace to body retaining bolts (2).
9. Remove the transmission tunnel cross-brace (1).
10. Support the exhaust system with a suitable jack.



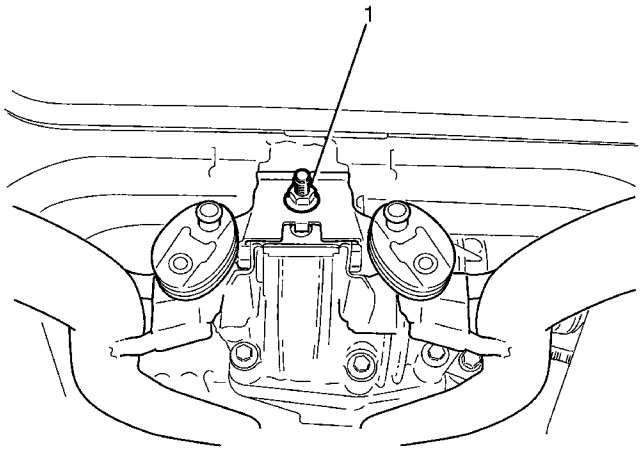
11. Remove the rear insulator hanger to body retaining bolts (1).



12. Remove the centre insulator hanger bracket to differential retaining nut (1).
13. Detach the exhaust crossover pipe assembly.
14. With the aid of an assistant or using a suitable jack; carefully lower the exhaust system from the vehicle.
15. If required, remove the right catalytic converter. Refer to Catalytic Converter Replacement - Right Side.
16. If required, remove the left catalytic converter. Refer to Catalytic Converter Replacement - Left Side.

Installation Procedure

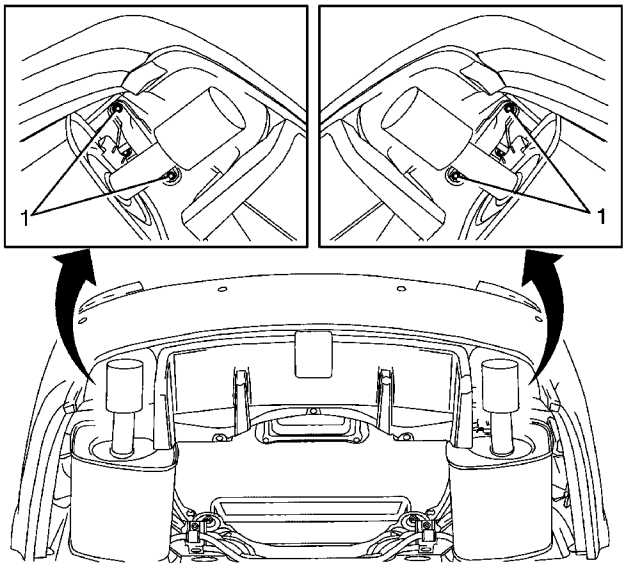
1. If removed, install the right catalytic converter. Refer to Catalytic Converter Replacement - Right Side.
2. If removed, install the left catalytic converter. Refer to Catalytic Converter Replacement - Left Side.
3. With the aid of an assistant or using a suitable jack; carefully raise the exhaust system up into the vehicle.



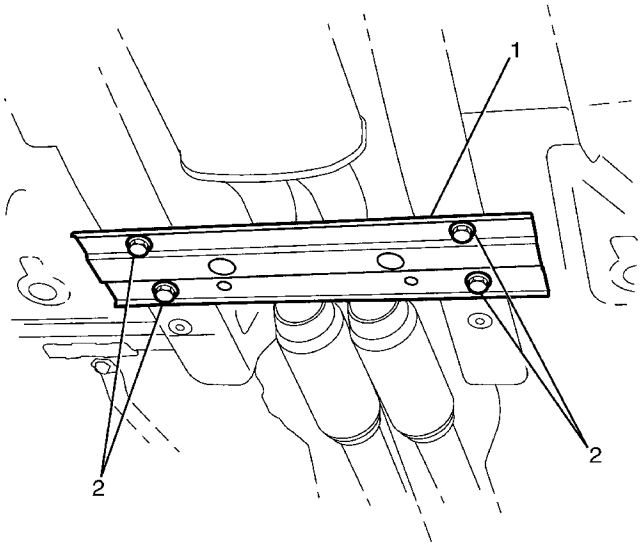
4. Align the exhaust system to the centre insulator hanger bracket to differential retaining stud (1).

Caution: Refer to Fastener Caution in the Preface section.

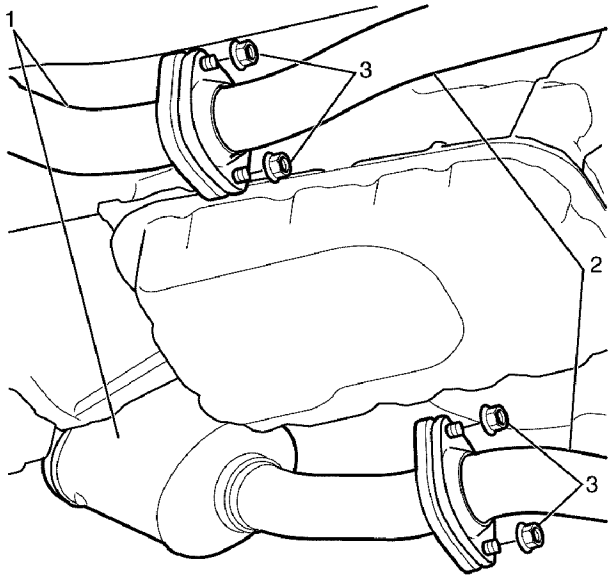
5. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



6. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.



7. Install the transmission tunnel cross-brace (1).
8. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



Note: Make sure that NEW flange gaskets are fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

9. Connect the catalytic converter assemblies (1) to the exhaust crossover pipe assembly (2).
10. Install the exhaust crossover pipe assembly to catalytic converter retaining nuts (3) and tighten to **45 N·m (33 lb ft)**.
11. Remove the jack supporting the exhaust system.
12. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align.

Refer to Exhaust System Alignment.

13. Install the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
14. Install the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .
15. Lower the vehicle.
16. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Exhaust System Replacement (V6 - Complete)

Removal Procedure

Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

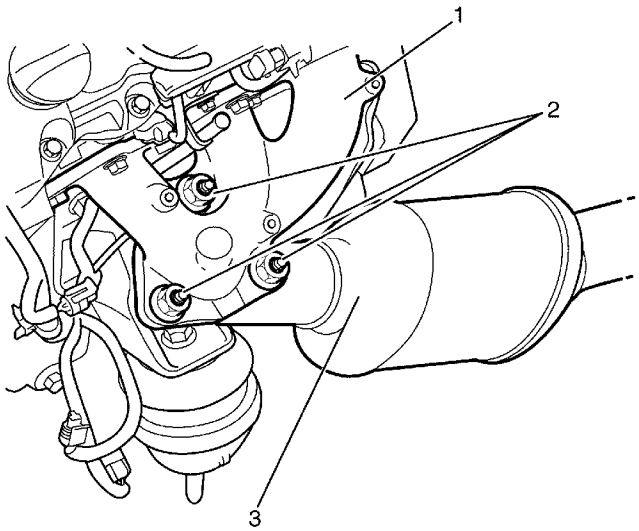
1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution in the Preface section.

4. Remove the left pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.
5. Remove the left exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side .
6. Remove the oil level indicator tube. Refer to Oil Level Indicator and Tube Removal .
7. Remove the right pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 .
8. Remove the right exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side.



Note: The left catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

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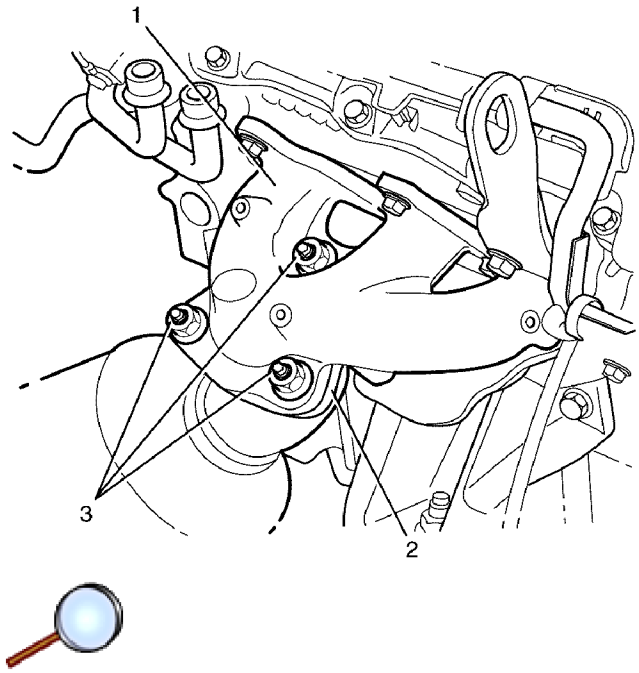
9. Remove the left catalytic converter to exhaust manifold retaining nuts (2).

   Discard the nuts.



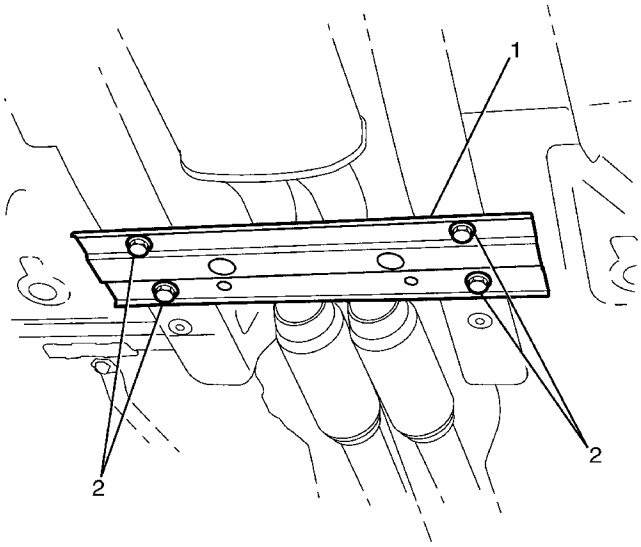
Note: The right catalytic converter to exhaust manifold retaining nuts (3) are single use parts. They must be discarded after removal.

10. Remove the right catalytic converter to exhaust manifold retaining nuts (3).

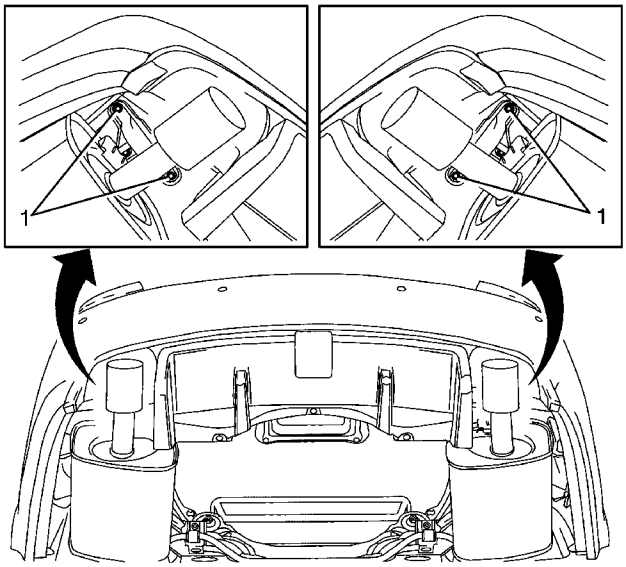
    Discard the nuts.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

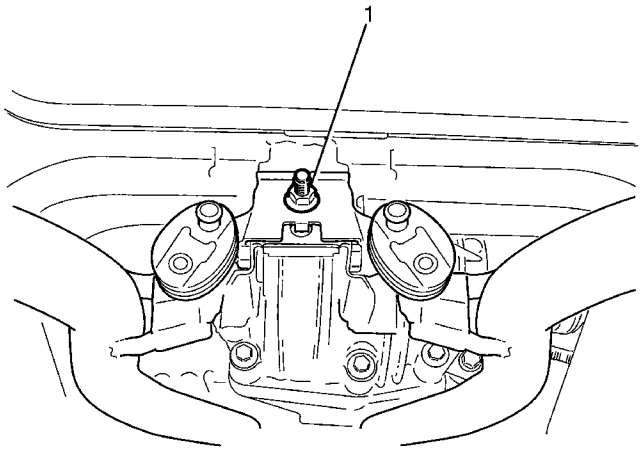
11. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
12. Remove the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 .
13. Remove the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .



14. Remove the transmission tunnel cross-brace to body retaining bolts (2).
15. Remove the transmission tunnel cross-brace (1).
16. Support the exhaust system with a suitable jack.

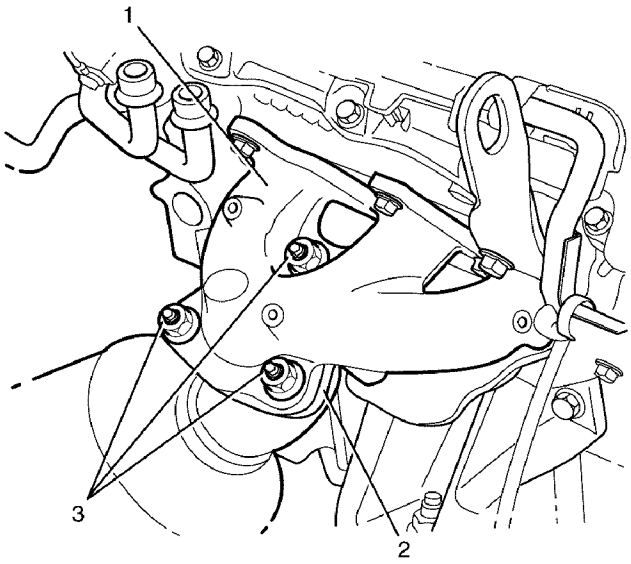


17. Remove the rear insulator hanger to body retaining bolts (1).



18. Remove the centre insulator hanger bracket to differential retaining nut (1).
19. With the aid of an assistant or using a suitable jack; detach the exhaust system from the centre insulator hanger bracket retaining stud (1) and carefully lower the exhaust system from the vehicle.

Installation Procedure



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

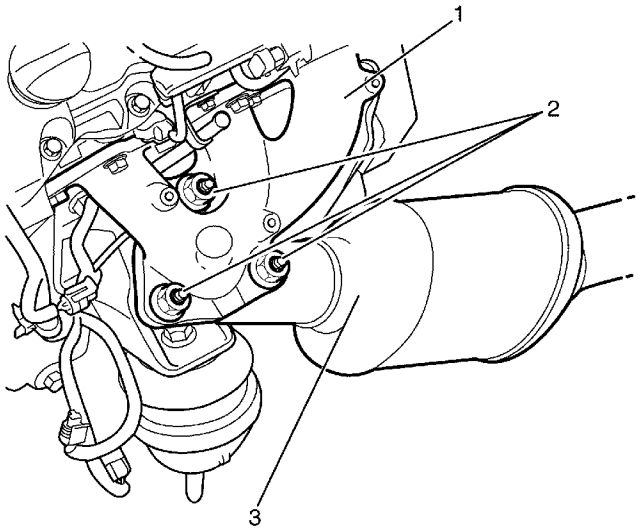
1. From underneath the vehicle, position the right catalytic converter (2) to the exhaust

manifold (1).

Note: Do not fully tighten the right catalytic converter to exhaust manifold retaining nuts (1) at this stage.

2. Install NEW right catalytic converter to exhaust manifold retaining nuts (1)

   Do not fully tighten at this stage.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

3. From underneath the vehicle, position the left catalytic converter (3) to the exhaust manifold (1).

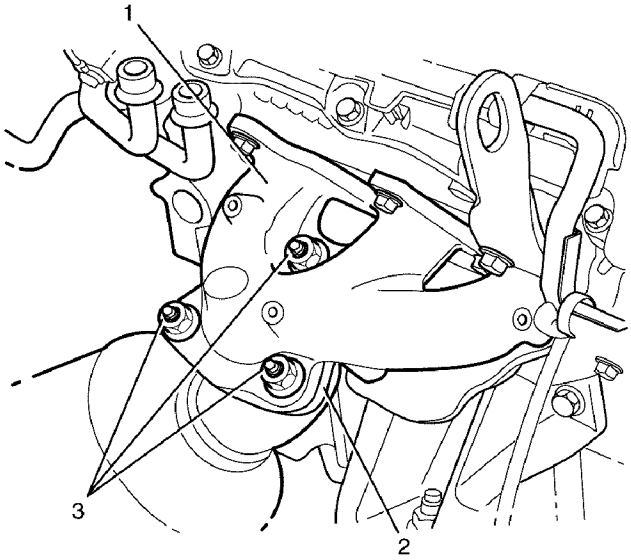
   Note: Do not fully tighten the left catalytic converter to exhaust manifold retaining nuts (3) at this stage.

4. Install NEW left catalytic converter to exhaust manifold retaining nuts (1)

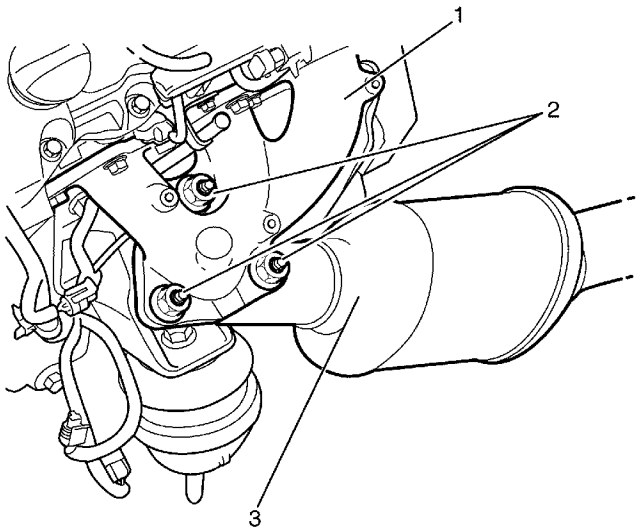
   Do not fully tighten at this stage.

5. Lower the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.



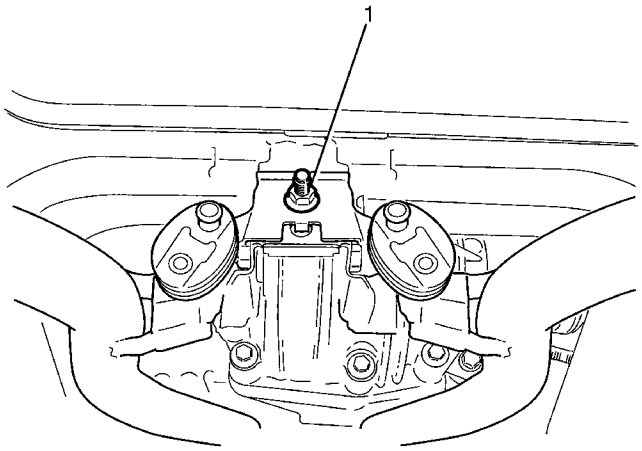
6. Tighten the right catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.



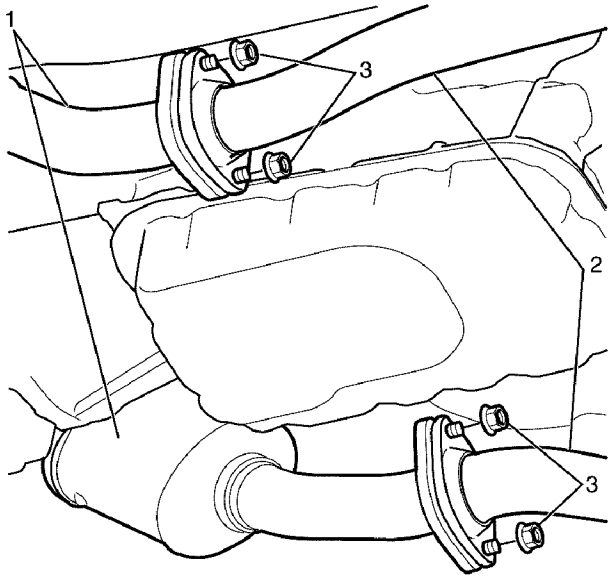
7. Tighten the left catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

8. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
9. With the aid of an assistant, or using a suitable jack, position the exhaust crossover pipe assembly to the vehicle.

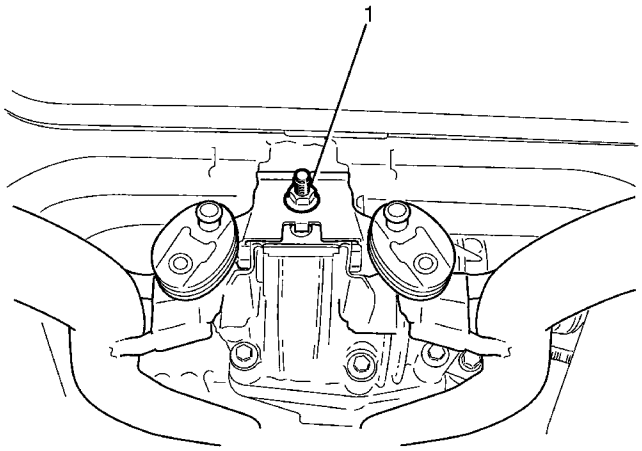


10. Align the exhaust system to the centre insulator hanger bracket to differential retaining stud (1).

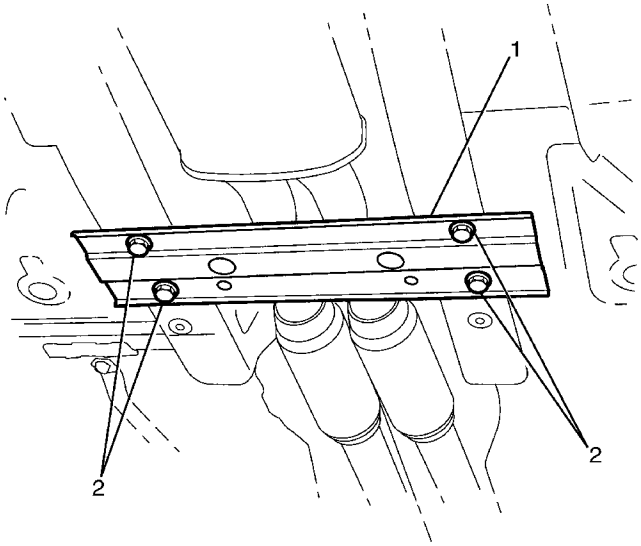


Note: Make sure that NEW flange gaskets are fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

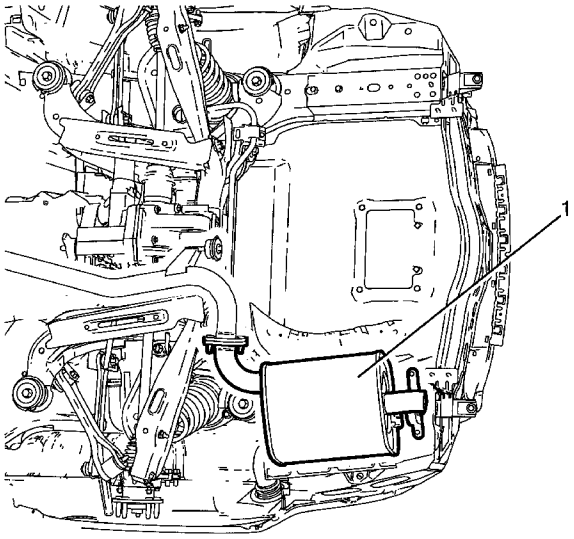
11. Connect the catalytic converter assemblies (1) to the exhaust crossover pipe assembly (2).
12. Install the exhaust crossover pipe assembly to catalytic converter retaining nuts (3) and tighten to **45 N·m (33 lb ft)**.



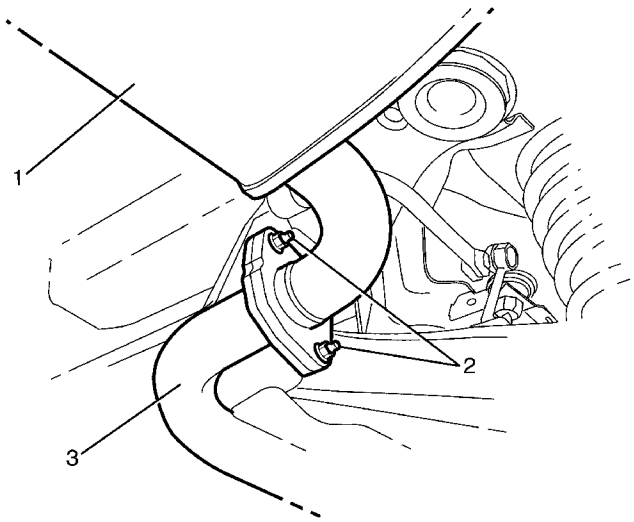
13. Install the centre insulator hanger bracket to differential retaining nut (1) and tighten to **45 N·m (33 lb ft)**.



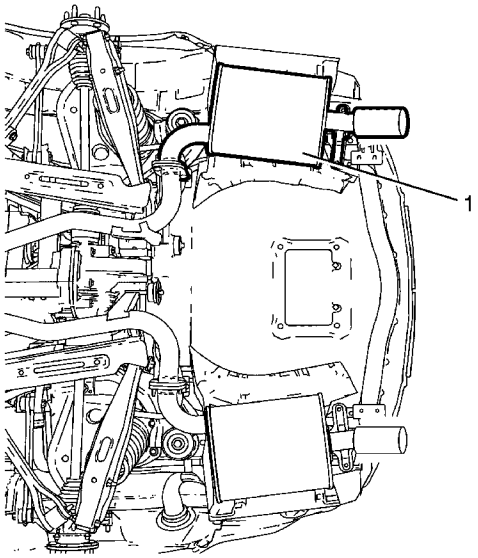
14. Install the transmission tunnel cross-brace (1).
15. Install the transmission tunnel cross-brace to body retaining bolts (2) and tighten to **12 N·m (9 lb ft)**.



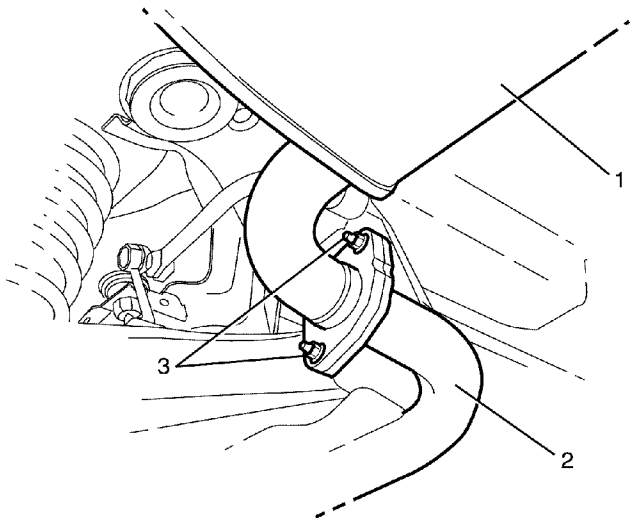
16. Install the right rear muffler (1) to the vehicle.



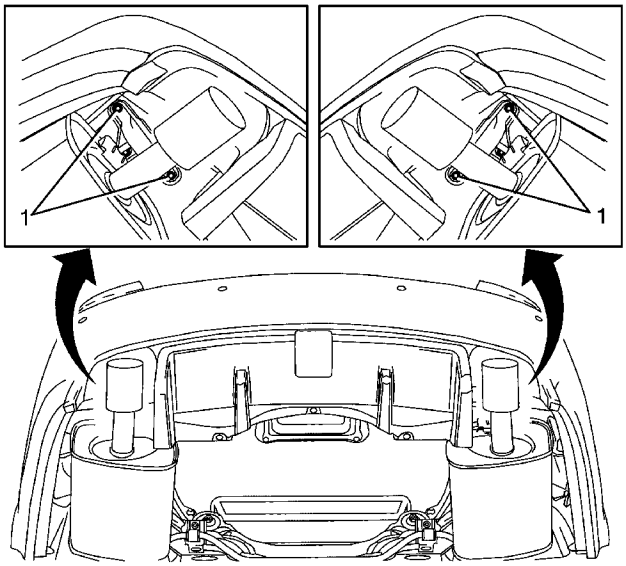
17. Connect the right rear muffler (1) to the exhaust crossover pipe assembly (2).
18. Install the right rear muffler to exhaust crossover pipe assembly retaining bolts (2) and tighten to **45 N·m (33 lb ft)**.



19. Install the left rear muffler (1) to the vehicle.



20. Connect the left rear muffler (1) to the exhaust crossover pipe assembly (2).
21. Install the left rear muffler to exhaust crossover assembly retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.



22. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.
23. Remove the jack supporting the exhaust system.
24. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
25. Install the right post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 2.
26. Install the left post-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .
27. Lower the vehicle.
28. Install the right exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side.
29. Install the right pre-catalytic convertor HO2S sensor. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
30. Install the oil level indicator tube. Refer to Oil Level Indicator and Tube Removal .
31. Install the left exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side.
32. Install the left pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 .
33. Install the engine cover. Refer to Engine Cover Replacement.
34. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Catalytic Converter Replacement - Left Side (V8)

Removal Procedure

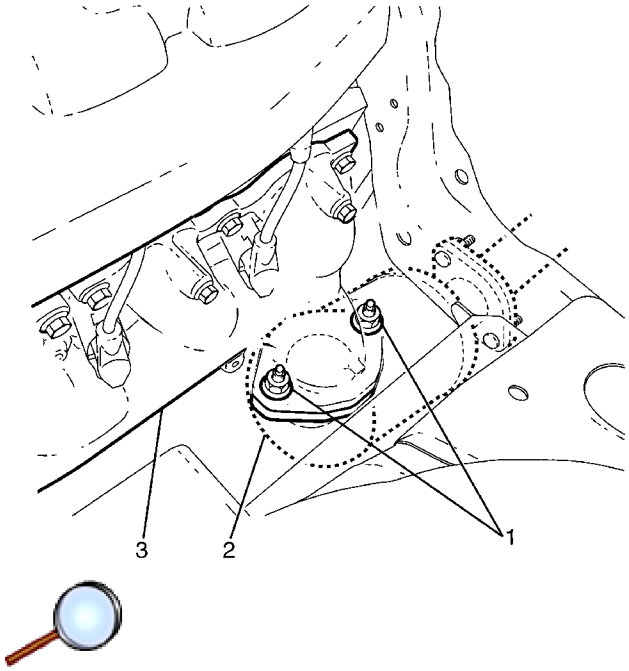
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.



Note: The left catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

3. Remove the left catalytic converter to exhaust manifold retaining nuts (1).

   Discard the nuts.

4. Disconnect the left catalytic converter (2) from the exhaust manifold (3).

   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

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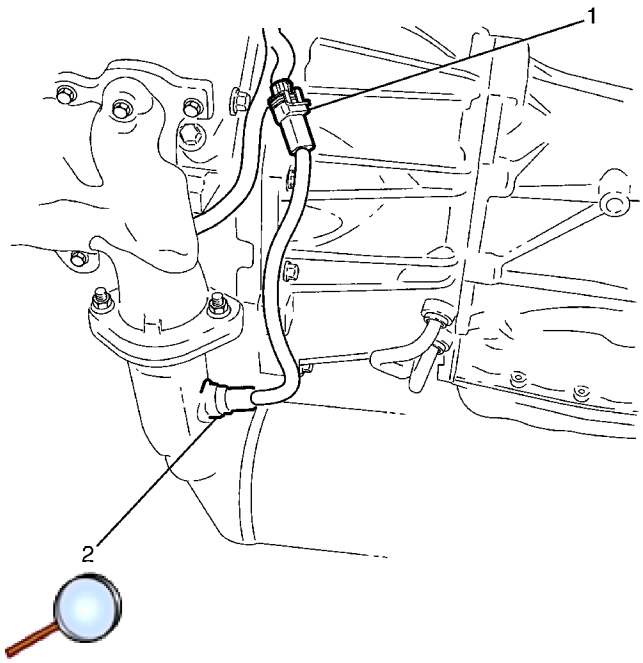
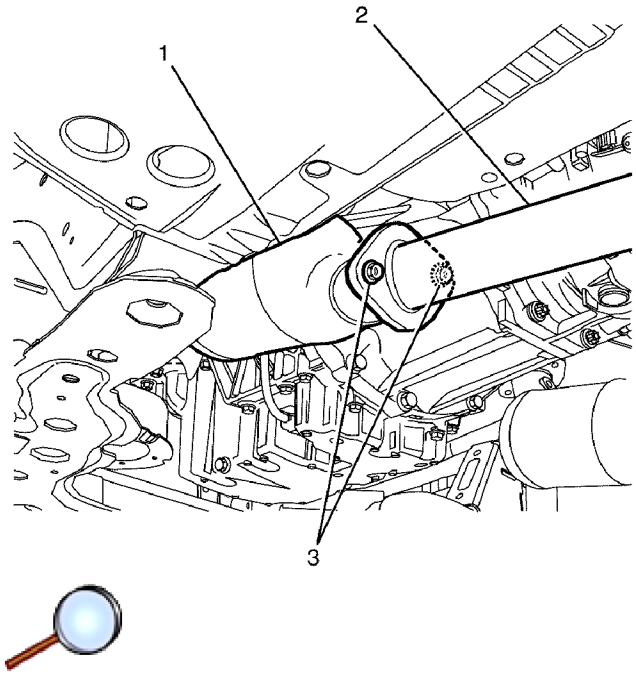
5. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution in the Preface section.



6. Disconnect the left pre-catalytic converter heated oxygen sensor (HO2S) electrical connector (1).

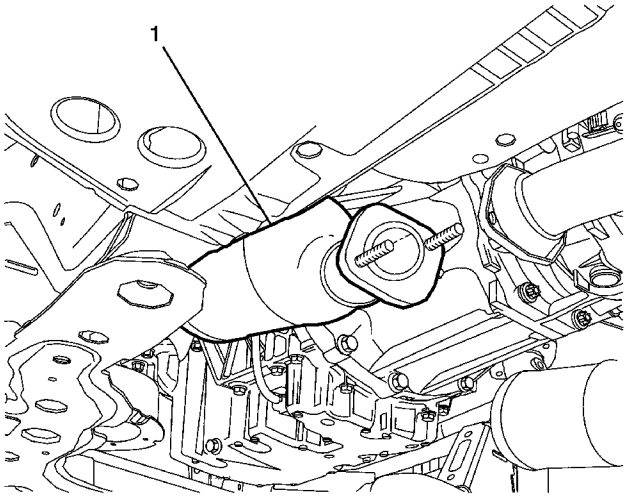


Note: The exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

7. Remove the exhaust crossover pipe assembly to left catalytic converter retaining nuts (3).

Discard the nuts.

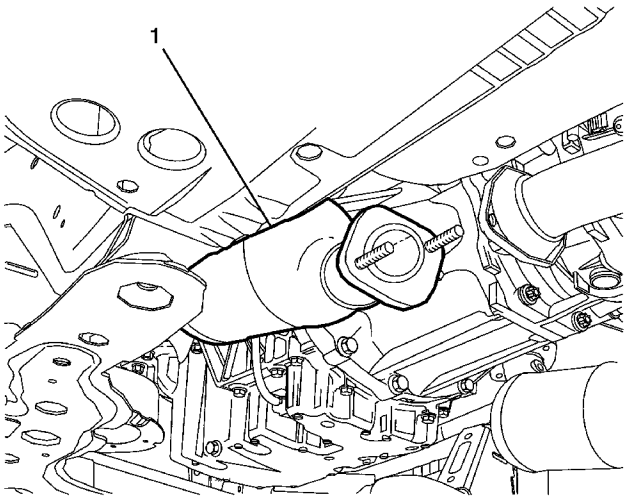
8. Disconnect the exhaust crossover pipe assembly (2) from the left catalytic converter (1).



9. Remove the left catalytic converter (1) from the vehicle.
10. Remove the left pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.

Installation Procedure

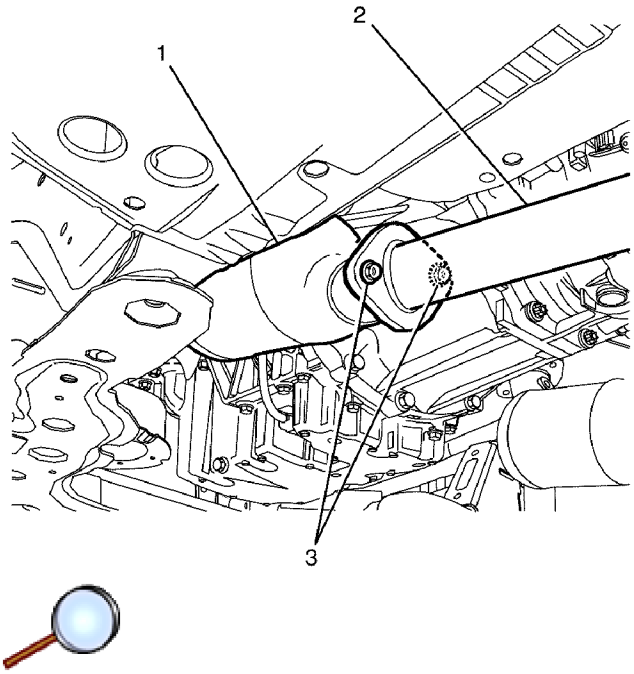
1. Install the left pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may

cause the exhaust system to perform poorly.

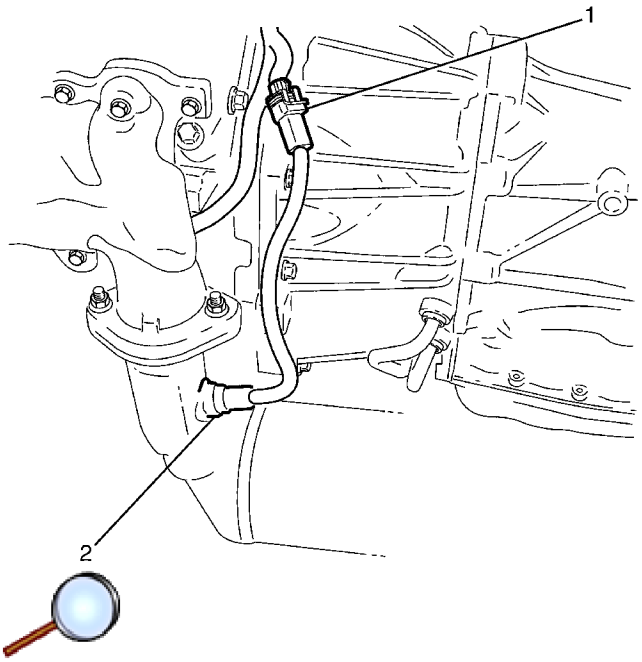
2. Install the left catalytic converter (1) to the vehicle.



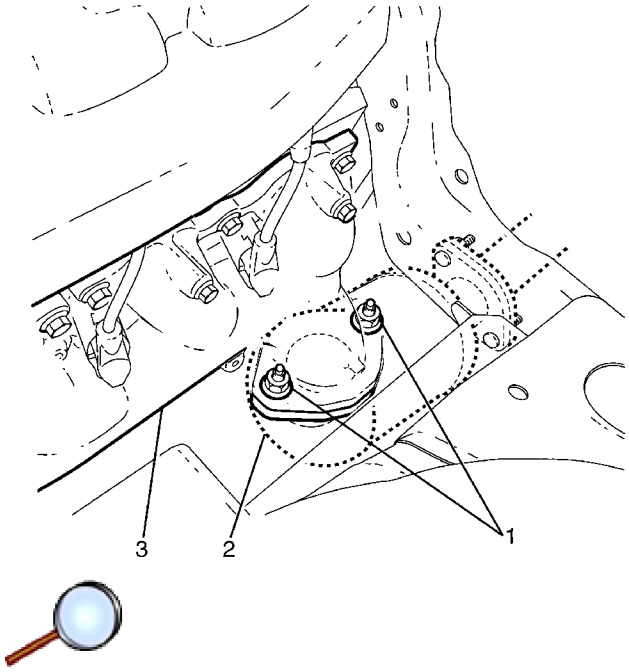
3. Align the exhaust crossover pipe assembly (2) to the left catalytic converter (1).

Caution: Refer to Fastener Caution in the Preface section.

4. Install the exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



5. Connect the left pre-catalytic converter HO2S electrical connector (1).



Note: Push up and forward on the left catalytic converter (2) to connect to the exhaust manifold (3).

6. Connect the left catalytic converter (2) to the exhaust manifold (3).

   Note: Do not fully tighten the left catalytic converter to exhaust manifold retaining nuts (3) at this stage.

7. Install the left catalytic converter to exhaust manifold retaining nuts (1).

   Do not fully tighten at this stage.

8. Lower the vehicle.
9. Tighten the left catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.
10. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
11. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Catalytic Converter Replacement - Left Side (V6)

Removal Procedure

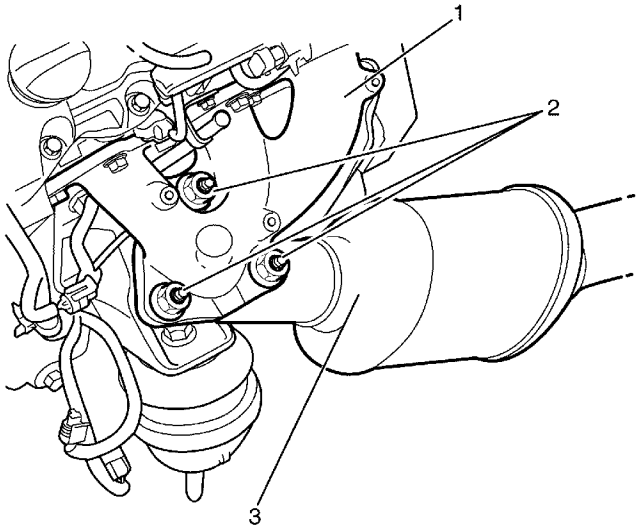
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the left pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.
5. Remove the left exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side .
6. Remove the oil level indicator tube. Refer to Oil Level Indicator and Tube Removal .



Note: The left catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

7. Remove the left catalytic converter to exhaust manifold retaining nuts (2).

Discard the nuts.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support

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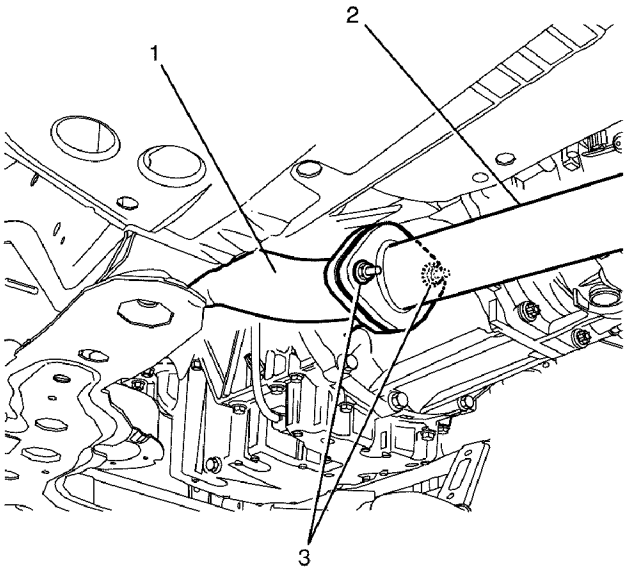
the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

8. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

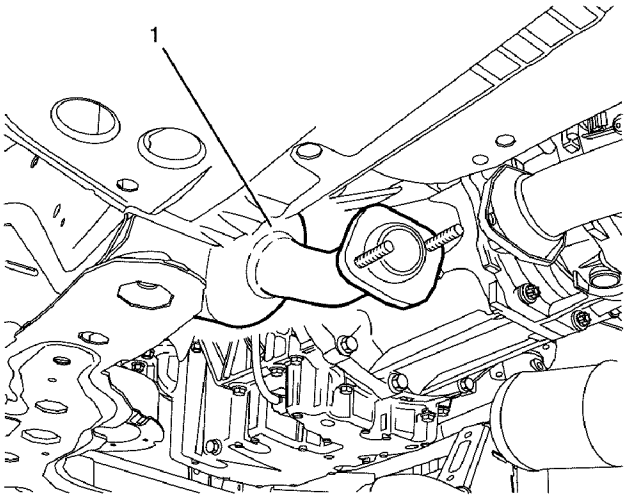


Note: The exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

9. Remove the exhaust crossover pipe assembly to left catalytic converter retaining nuts (3).

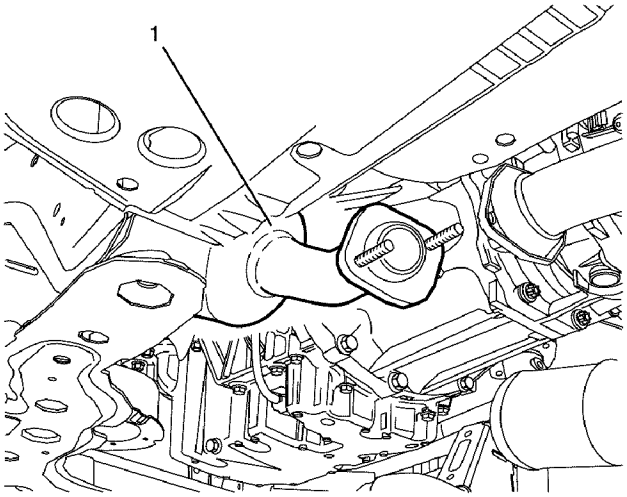
   Discard the nuts.

10. Pull down and back on the left catalytic converter (3) to disconnect from the exhaust manifold (1).
11. Disconnect the exhaust crossover pipe assembly (2) from the left catalytic converter pipe (1).



12. Remove the left catalytic converter (1) from the vehicle.

Installation Procedure

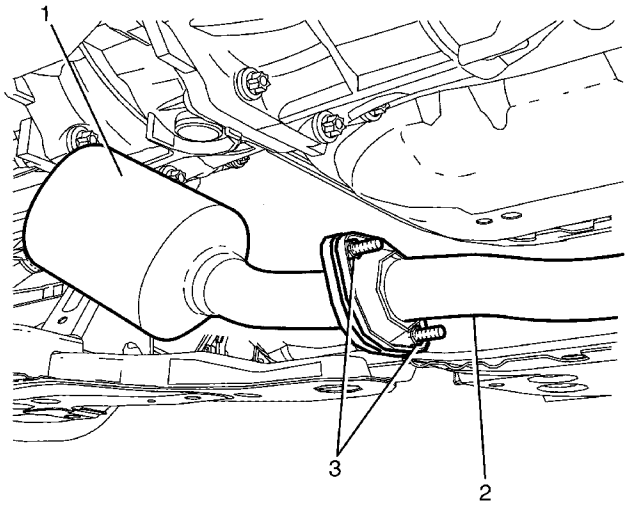


Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle.

Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

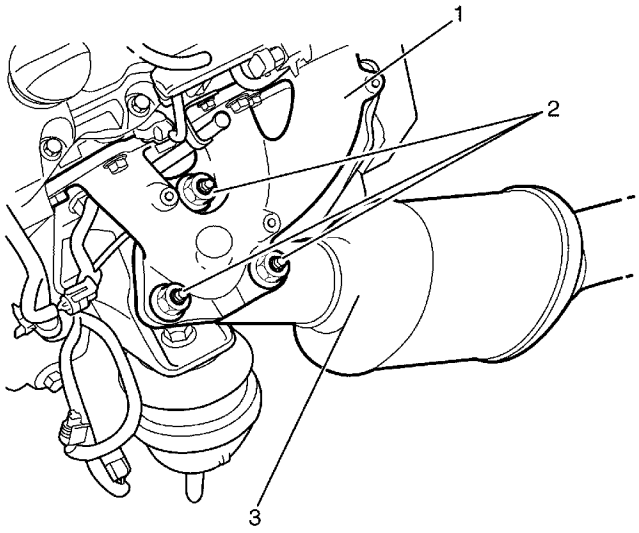
2. Install the left catalytic converter (1) to the vehicle.



3. Align the exhaust crossover pipe assembly (2) to the left catalytic converter pipe (1).

Caution: Refer to Fastener Caution in the Preface section.

4. Install NEW exhaust crossover pipe assembly to left catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.
5. Lower the vehicle.



6. Install NEW left catalytic converter to exhaust manifold retaining nuts (1) and tighten to **45 N·m (33 lb ft)**.
7. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
8. Install the oil level indicator tube. Refer to Oil Level Indicator and Tube Removal .

9. Install the left exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Left Side .
10. Install the left pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 .
11. Install the engine cover. Refer to Engine Cover Replacement.
12. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

Catalytic Converter Replacement - Right Side (V8)

Removal Procedure

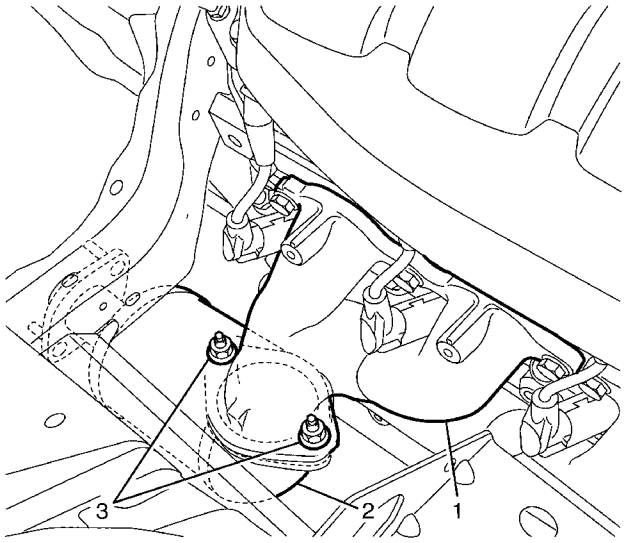
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.



Note: The right catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

3. Remove the right catalytic converter to exhaust manifold retaining nuts (3).

   Discard the nuts.

4. Disconnect the right catalytic converter (2) from the exhaust manifold (1).

   Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

5. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

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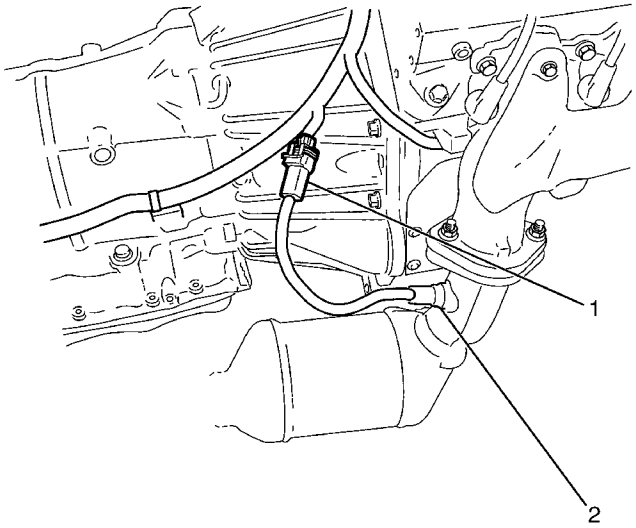
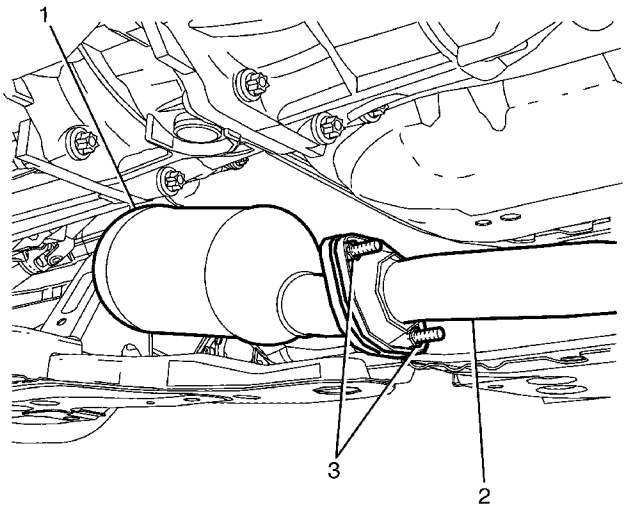
Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution in the Preface section.



6. Disconnect the right pre-catalytic converter heated oxygen sensor (HO2S) electrical connector (1).

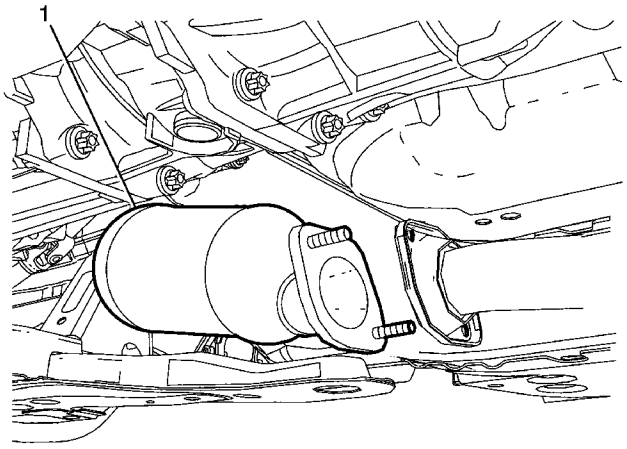


Note: The exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

7. Remove the exhaust crossover pipe assembly to right catalytic converter retaining nuts (3).

   Discard the nuts.

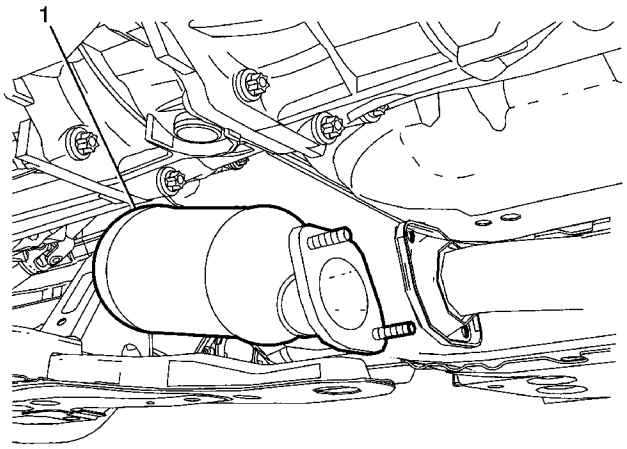
8. Disconnect the exhaust crossover pipe assembly (2) from the right catalytic converter (1).



9. Remove the right catalytic converter (1) from the vehicle.
10. Remove the right pre-catalytic converter HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.

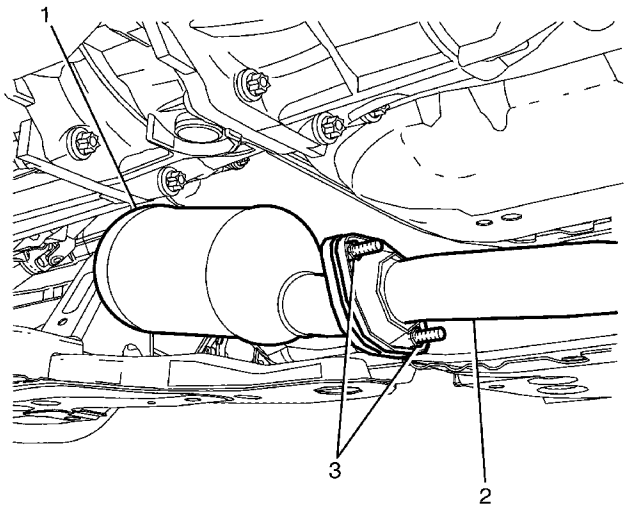
Installation Procedure

1. Install the right pre-catalytic converter heated oxygen sensor (HO2S) to the right catalytic converter. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.



Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

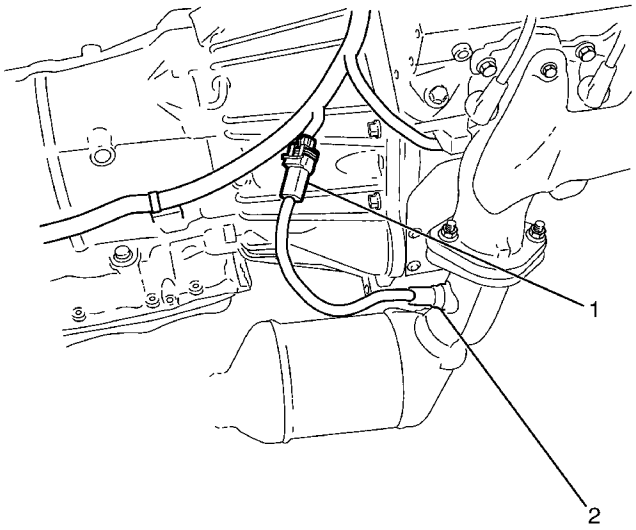
2. Install the right catalytic converter (1) to the vehicle.



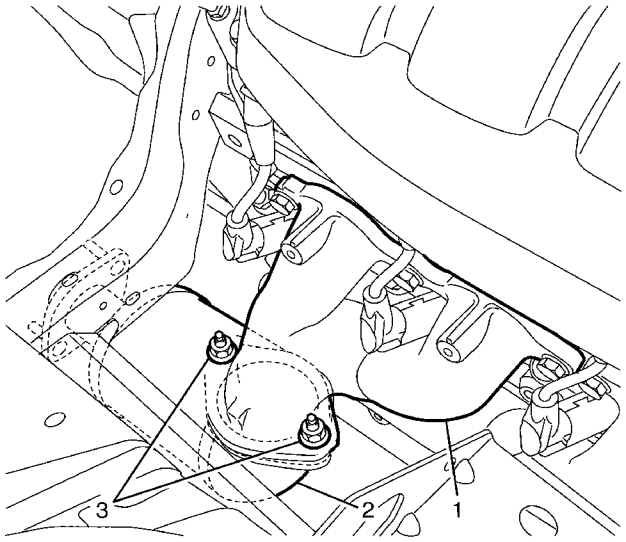
3. Align the exhaust crossover pipe assembly (2) to the right catalytic converter (1).

Caution: Refer to Fastener Caution in the Preface section.

4. Install the exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.



5. Connect the right pre-catalytic converter HO2S electrical connector (1).



Note: Push up and forward on the right catalytic converter (2) to connect to the exhaust manifold (3).

6. Connect the right catalytic converter (2) to the exhaust manifold (1).

   Note: Do not fully tighten the right catalytic converter to exhaust manifold retaining nuts (3) at this stage.

7. Install the right catalytic converter to exhaust manifold retaining nuts (3).

   Do not fully tighten at this stage.

8. Lower the vehicle.
9. Tighten the right catalytic converter to exhaust manifold retaining nuts (1) to **45 N·m (33 lb ft)**.
10. Make sure the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
11. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Catalytic Converter Replacement - Right Side (V6)

Removal Procedure

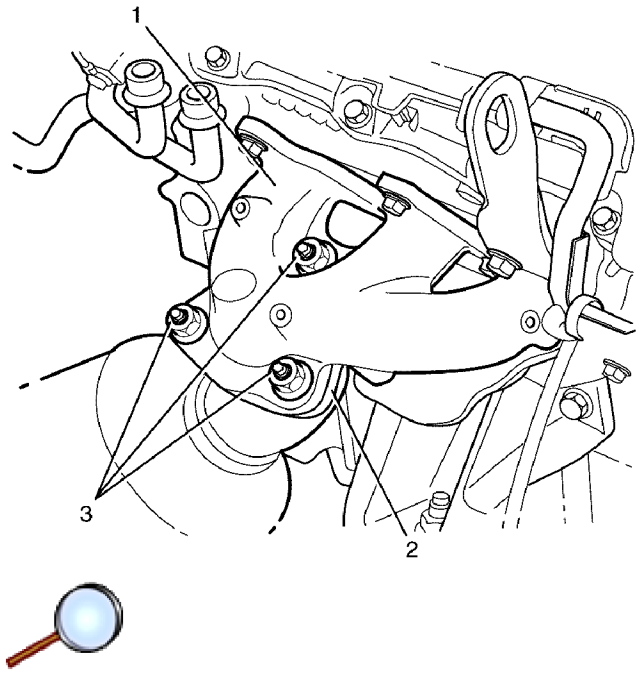
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

   Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the right pre-catalytic convertor heated oxygen sensor (HO2S) sensor. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
5. Remove the right exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side .



Note: The right catalytic converter to exhaust manifold retaining nuts (1) are single use parts. They must be discarded after removal.

6. Remove the right catalytic converter to exhaust manifold retaining nuts (3).

   Discard the nuts.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

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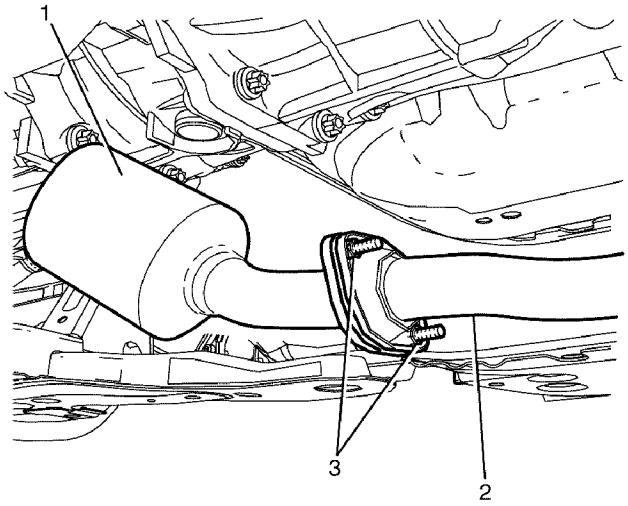
7. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

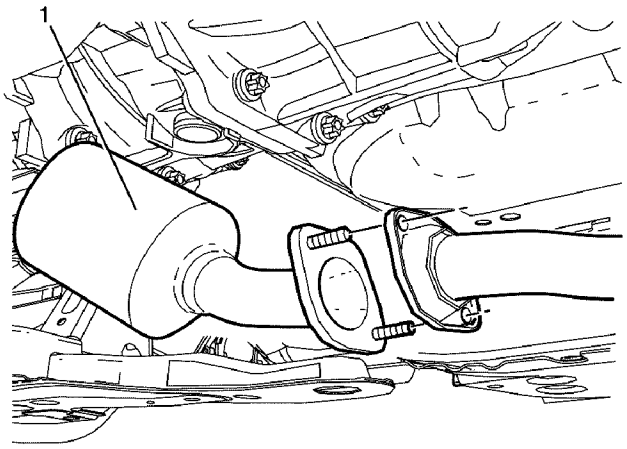


Note: The exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) are single use parts. They must be discarded after removal.

8. Remove the exhaust crossover pipe assembly to right catalytic converter retaining nuts (3).

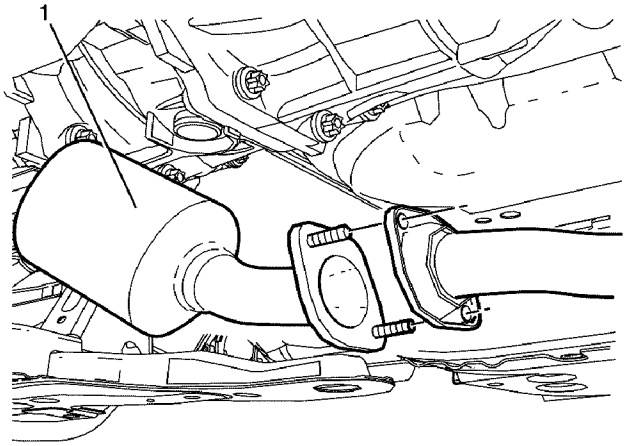
   Discard the nuts.

9. Pull down and back on the right catalytic converter (1) to disconnect from the exhaust manifold.
10. Disconnect the exhaust crossover pipe assembly (2) from the right catalytic converter (1).



11. Remove the right catalytic converter (1) from the vehicle.

Installation Procedure

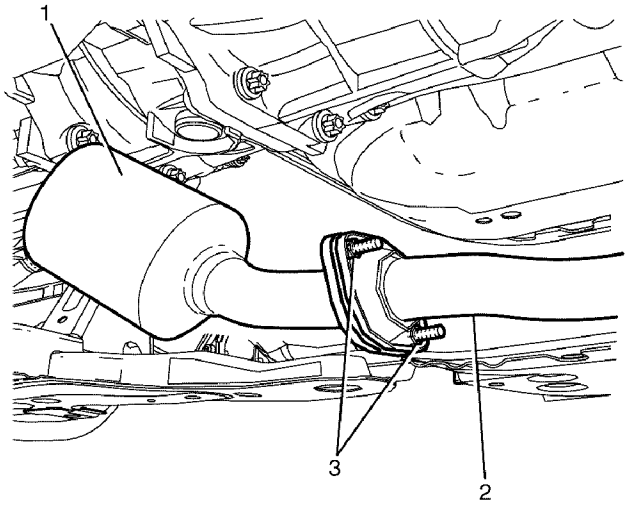


Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Note: Make sure that a NEW sealing ring is fitted prior to installation. Failure to comply may cause the exhaust system to perform poorly.

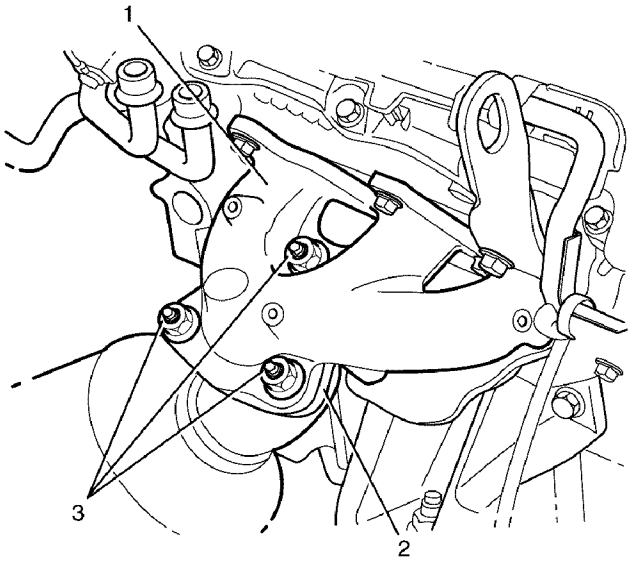
2. Install the right catalytic converter (1) to the vehicle.



3. Align the exhaust crossover pipe assembly (2) to the right catalytic converter (1).

Caution: Refer to Fastener Caution in the Preface section.

4. Install NEW exhaust crossover pipe assembly to right catalytic converter retaining nuts (3) and tighten to **40 N·m (30 lb ft)**.
5. Lower the vehicle.

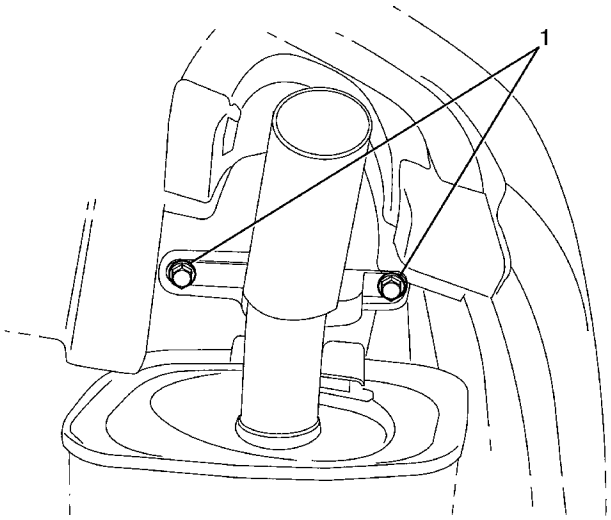


6. Install NEW right catalytic converter to exhaust manifold retaining nuts (1) and tighten to **45 N·m (33 lb ft)**.
7. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
8. Install the right exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield Replacement - Right Side .
9. Install the right pre-catalytic convertor HO2S sensor. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
10. Install the engine cover. Refer to Engine Cover Replacement.
11. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .

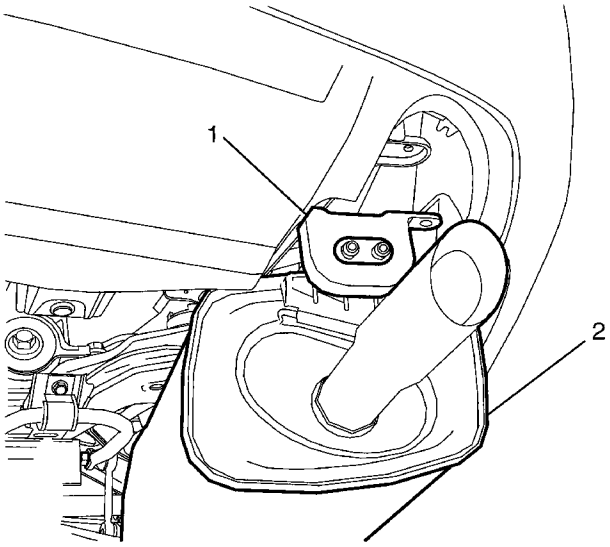
Exhaust System Insulator, Hanger, Bracket Replacement

Removal Procedure

Warning: Refer to Exhaust Service Warning in the Preface section.



1. Remove the rear Insulator hanger to body retaining bolts (1).



2. Remove the rear insulator hanger (1) from the rear muffler (2).

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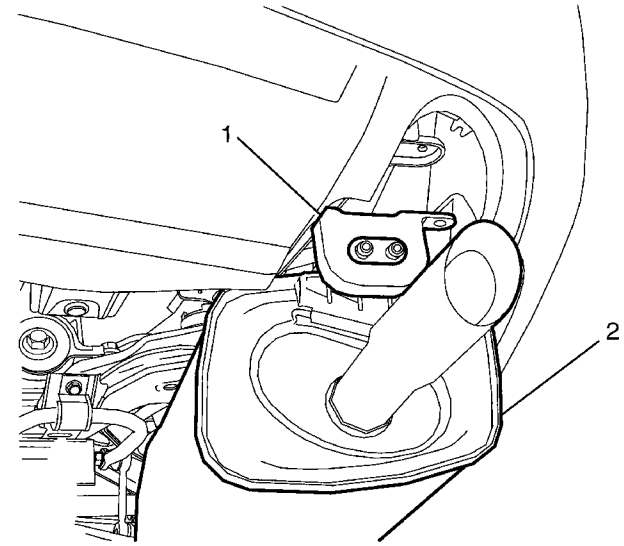
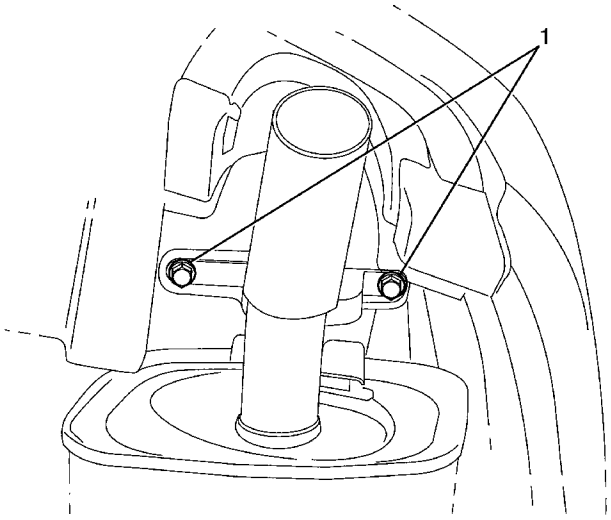
Installation Procedure



1. Install the rear insulator hanger (1) to the rear muffler (2).

   Caution: Refer to Fastener Caution in the Preface section.



2. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.

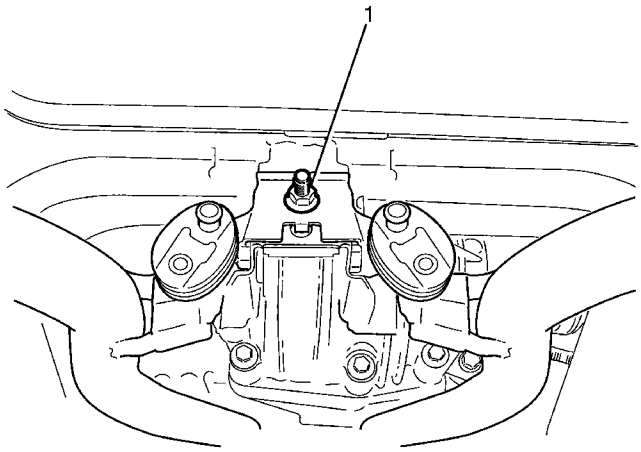
Exhaust Hanger Mounting Bracket Replacement

Removal Procedure

Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Detach the intermediate exhaust assembly (2) by removing the center insulator hanger bracket to differential retaining bolt (1).
3. Remove the intermediate exhaust assembly to center insulator hanger bracket insulators.

Installation Procedure

Caution: Refer to Fastener Caution in the Preface section.

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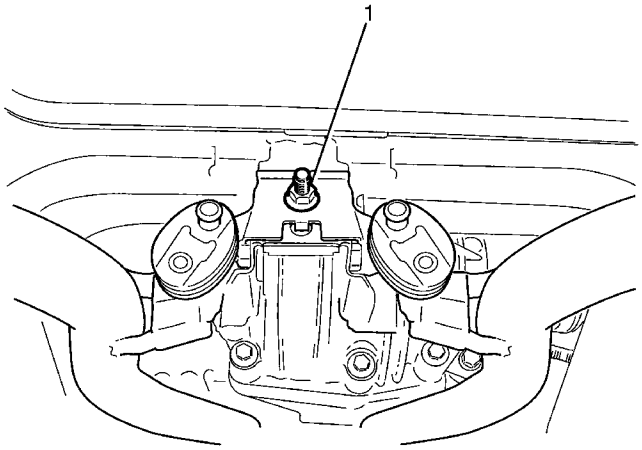


1. Install the intermediate exhaust assembly (2) by removing the center insulator hanger bracket to differential retaining bolt (1). Tighten the nuts to **45 N·m (33 lb ft)**.
2. Install the intermediate exhaust assembly to center insulator hanger bracket insulators.
3. Lower the vehicle.

Exhaust Muffler Replacement - Left Side

Removal Procedure

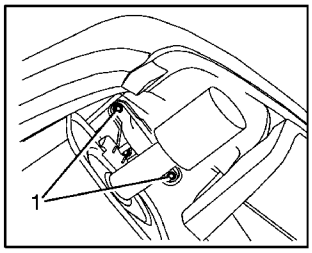
Warning: Refer to Safety Glasses Warning in the Preface section.

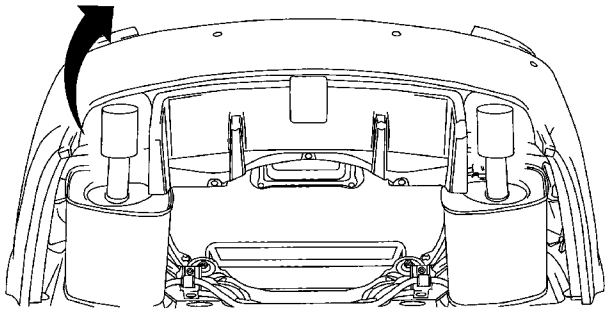
Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Support the exhaust system using a suitable jack.





3. Remove the rear insulator hanger to body retaining bolts (1).

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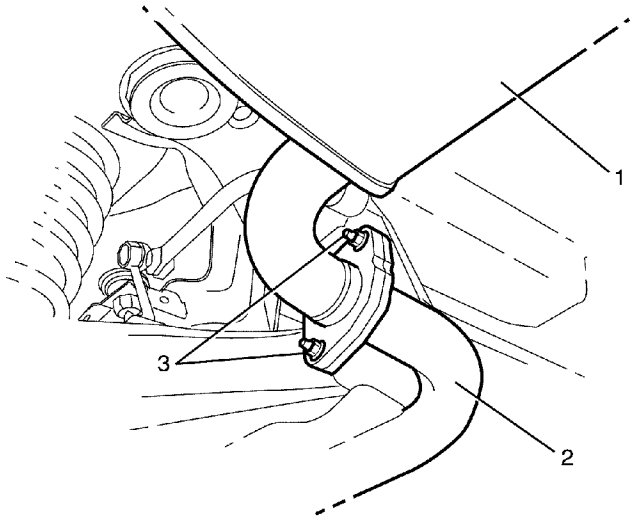
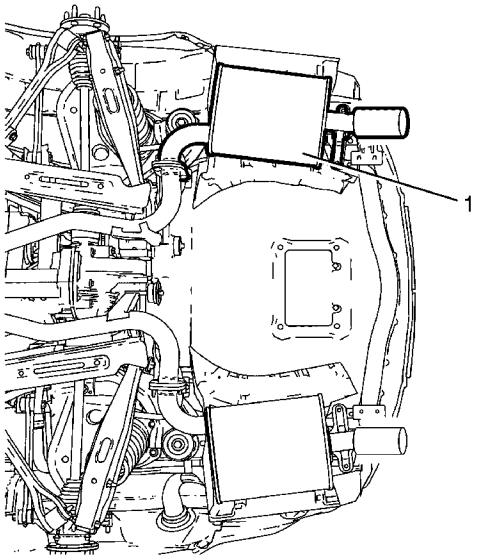


Note: The left rear muffler to intermediate exhaust assembly retaining nuts (3) are single use parts. They must be discarded after removal.

4. Remove the left rear muffler to intermediate exhaust assembly retaining bolts (3).
5. Disconnect the left rear muffler (1) from the intermediate exhaust assembly (2).

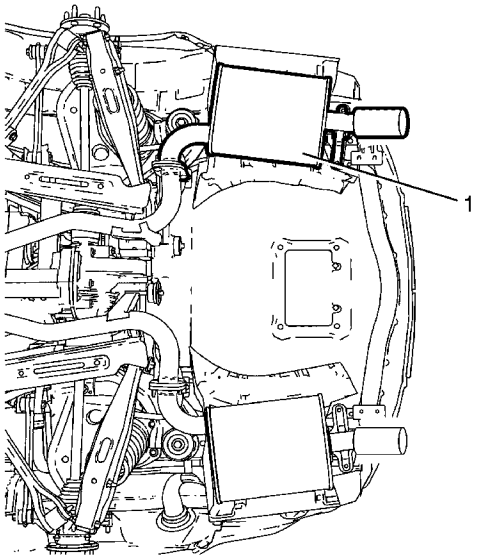


6. Remove the left rear muffler (1) from the vehicle.

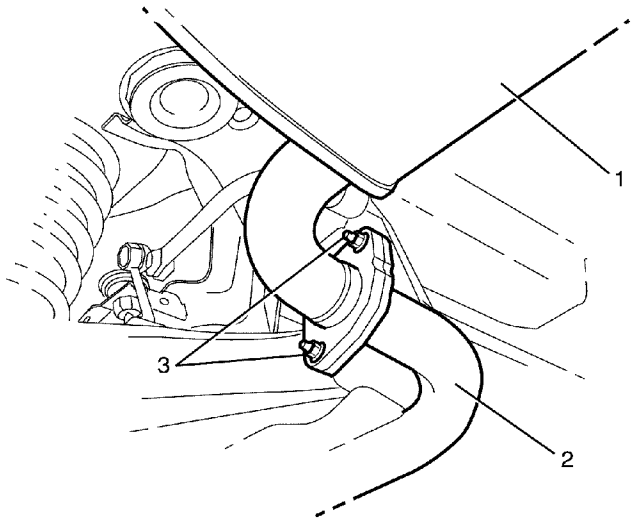
Installation Procedure

Note: The originally equipped exhaust extension pipe can be cut and reused when replacing a rear muffler. Only reuse if the extension pipe is in an acceptable condition.

1. Clean the threads of the rear exhaust assembly with a suitable cleaning solvent.



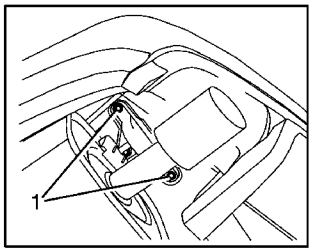
2. Install the left rear muffler (1) to the vehicle.

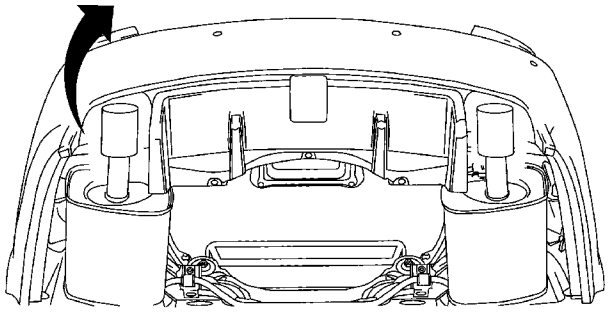


3. Connect the left rear muffler (1) to the intermediate exhaust assembly (2).

   Caution: Refer to Fastener Caution in the Preface section.

4. Install the left rear muffler to intermediate exhaust assembly retaining bolts (3) and tighten to **45 N·m (33 lb ft)**.





5. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.
6. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
7. Lower the vehicle to the ground.

Exhaust Muffler Replacement - Right Side

Removal Procedure

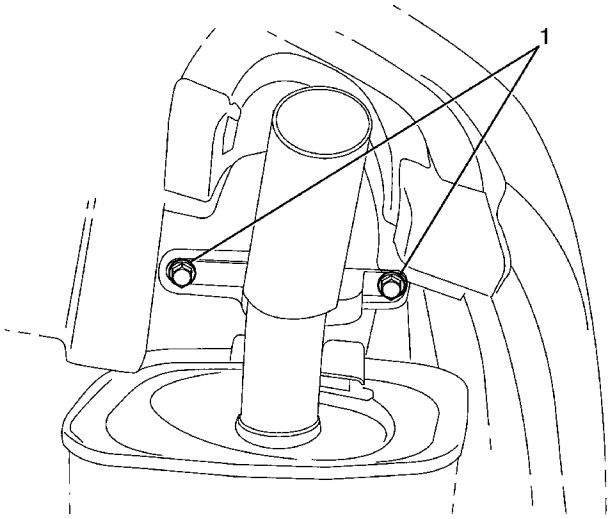
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Support the exhaust system using a suitable jack.



3. Remove the rear insulator hanger to body retaining bolts (1).

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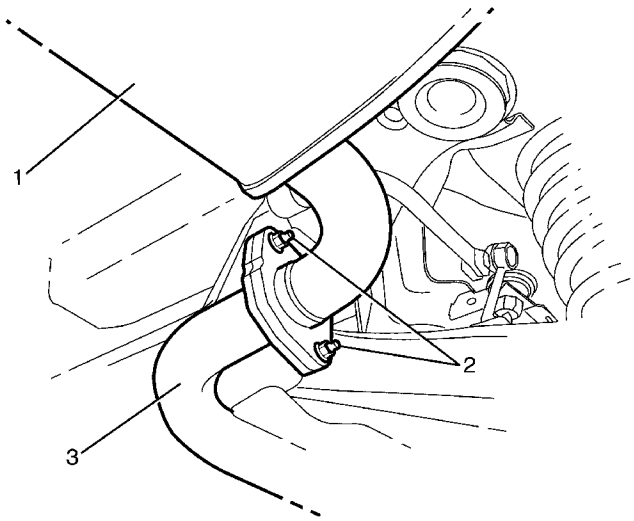
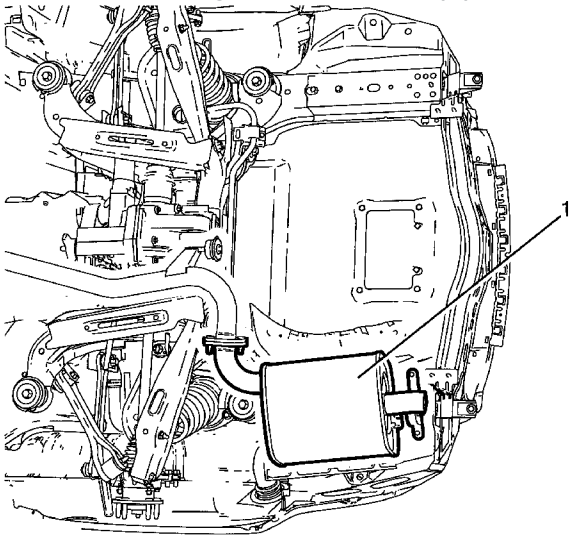


Note: The right rear muffler to intermediate exhaust assembly retaining nuts (2) are single use parts. They must be discarded after removal.

4. Remove the right rear muffler to intermediate exhaust assembly retaining bolts (2).
5. Disconnect the right rear muffler (1) from the intermediate exhaust assembly (3).

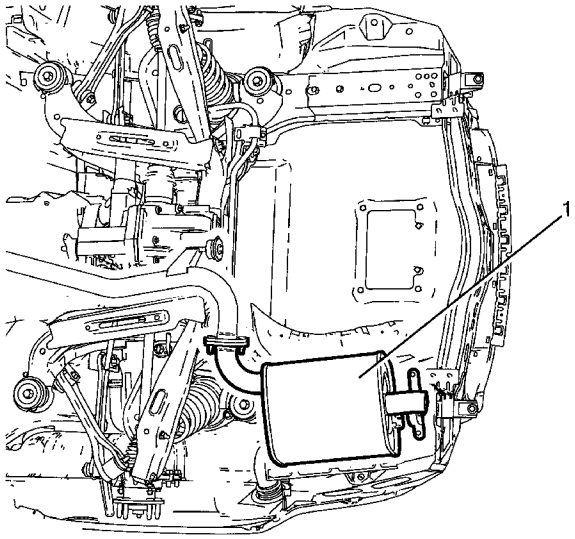


6. Remove the right rear muffler (1) from the vehicle.

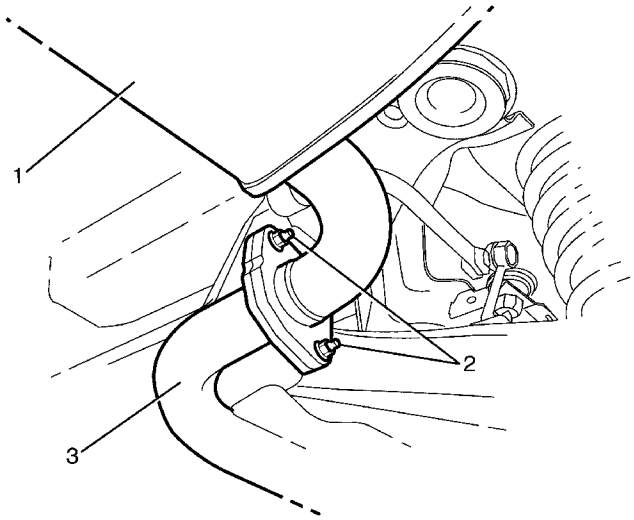
Installation Procedure

Note: The originally equipped exhaust extension pipe can be cut and reused when replacing a rear muffler. Only reuse if the extension pipe is in an acceptable condition.

1. Clean the threads of the rear exhaust assembly with a suitable cleaning solvent.



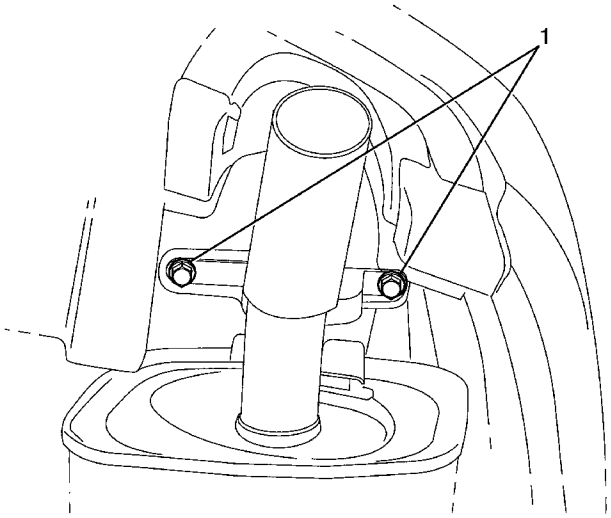
2. Install the right rear muffler (1) to the vehicle.



3. Align the right rear muffler (1) to the intermediate exhaust assembly (3).

Caution: Refer to Fastener Caution in the Preface section.

4. Install the right rear muffler to intermediate exhaust assembly retaining bolts (2) and tighten to **45 N·m (33 lb ft)**.



5. Install the rear insulator hanger to body retaining bolts (1) and tighten to **26 N·m (19 lb ft)**.
6. Make sure that the exhaust system is clear of all other components and chassis. If the exhaust system is not clear of all the other components loosen all retaining nuts and re-align. Refer to Exhaust System Alignment.
7. Lower the vehicle.

Fuel Tank Heat Shield Replacement

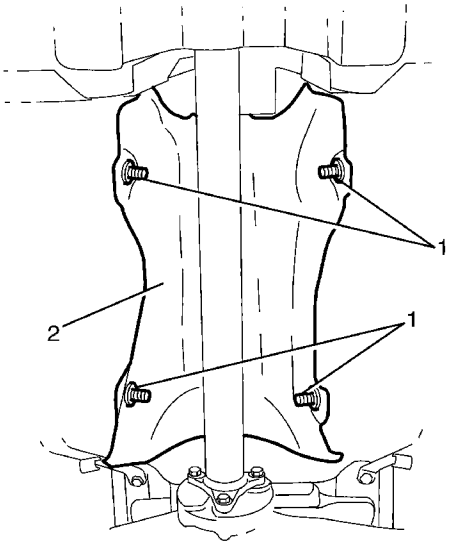
Removal Procedure

Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Warning: Refer to Exhaust Service Warning in the Preface section.



2. Remove the fuel tank heat shield to fuel tank retaining nuts (1).
3. Remove the fuel tank heat shield (2).

Installation Procedure

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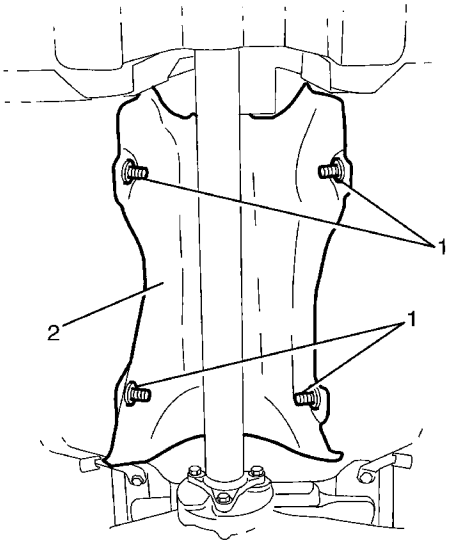


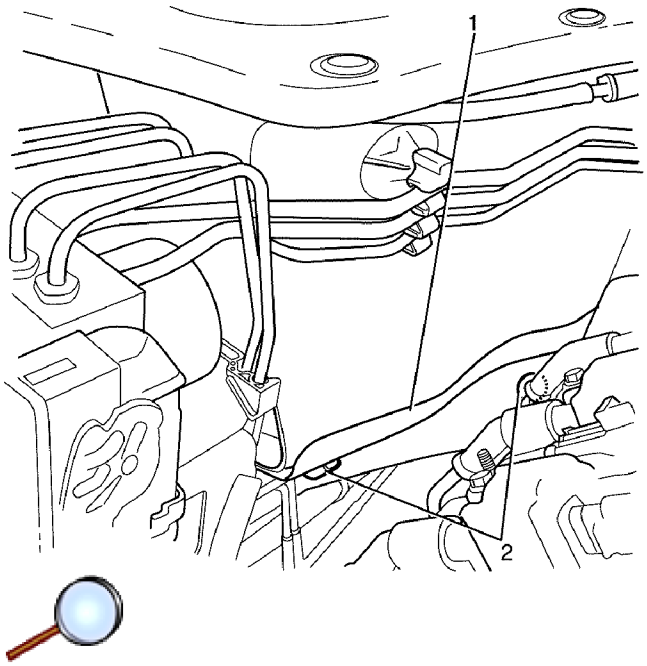
1. Position the fuel tank heat shield (2) to the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the fuel tank heat shield to fuel tank retaining nuts (1) and tighten to **4 N·m (35 lb in)**.
3. Lower the vehicle to the ground.

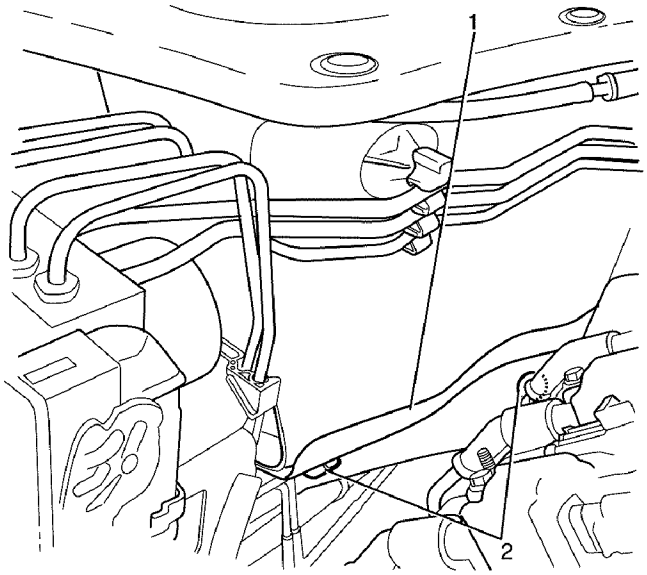
Exhaust Manifold Heat Shield Replacement

Removal Procedure



1. Remove the exhaust manifold heat shield to air box retaining clips (2).
2. Remove the exhaust manifold heat shield (1) from the vehicle.

Installation Procedure



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1. Install the exhaust manifold heat shield (1) to the vehicle.
2. Install the exhaust manifold heat shield to air box retaining clips (2).

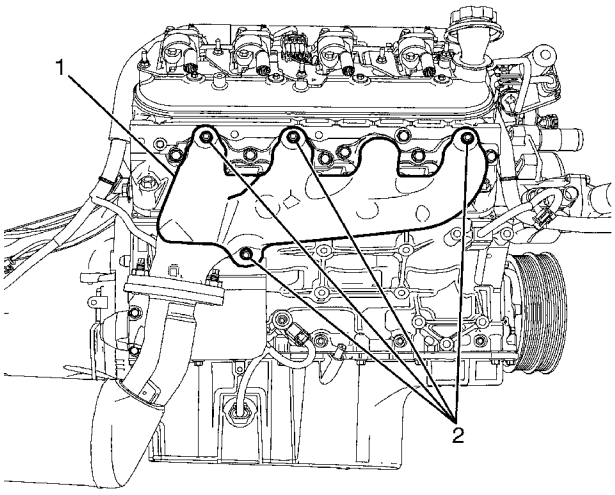
Exhaust Manifold Heat Shield Replacement - Right Side (V8)

Removal Procedure

1. Remove the engine cover. Refer to Engine Cover Replacement.
2. Remove the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement.

Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.



3. Remove the exhaust manifold heat shield to exhaust manifold retaining bolts (2).
4. Remove the exhaust manifold heat shield (1) from the exhaust manifold.

Installation Procedure

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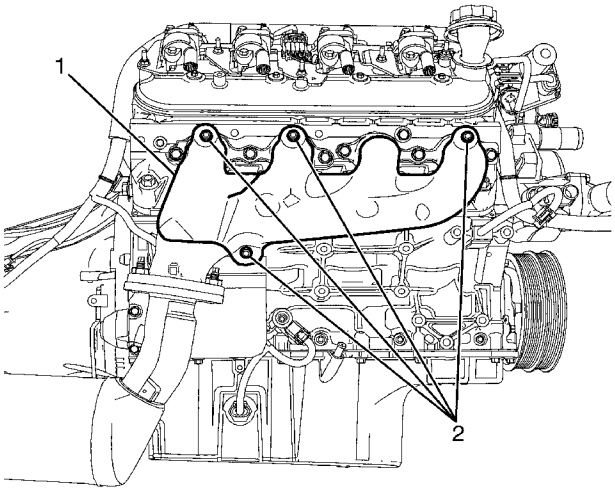


1. Position the exhaust manifold heat shield (1) to the exhaust manifold.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the exhaust manifold heat shield to exhaust manifold retaining bolts (2) and tighten to **10 N·m (89 lb in)**.
3. Install the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement.
4. Install the engine cover. Refer to Engine Cover Replacement.

Exhaust Manifold Heat Shield Replacement - Right Side (V6)

Removal Procedure

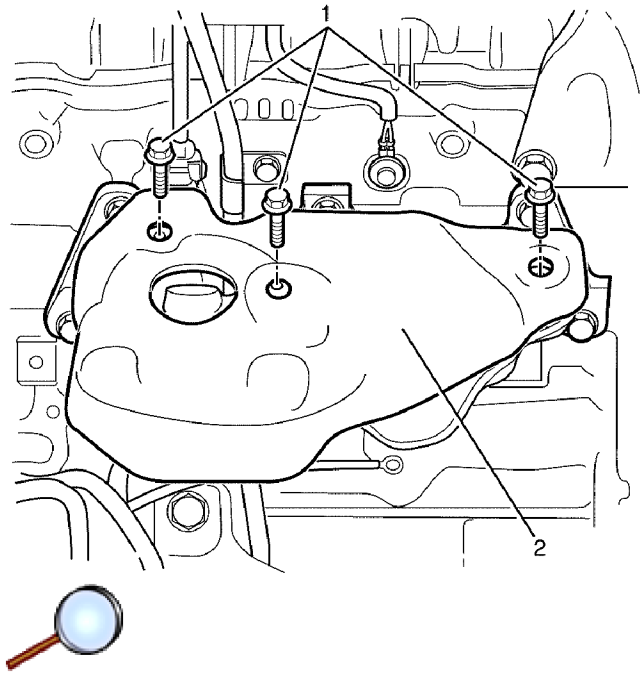
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the right pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.



5. Remove the exhaust manifold heat shield to exhaust manifold retaining bolts (1).
6. Remove the exhaust manifold heat shield (2).

Installation Procedure

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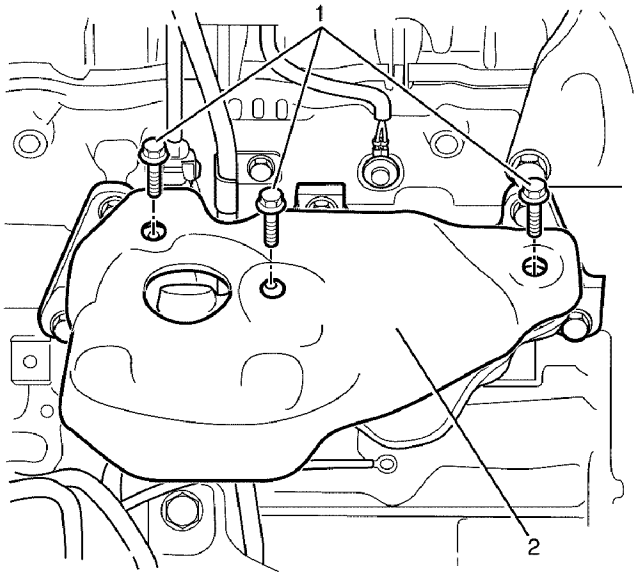


1. Install the exhaust manifold heat shield (2).

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the exhaust manifold heat shield to exhaust manifold retaining bolts (2) and tighten to **10 N·m (89 lb in)**.
3. Install the right pre-catalytic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1.
4. Install the engine cover. Refer to Engine Cover Replacement.
5. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

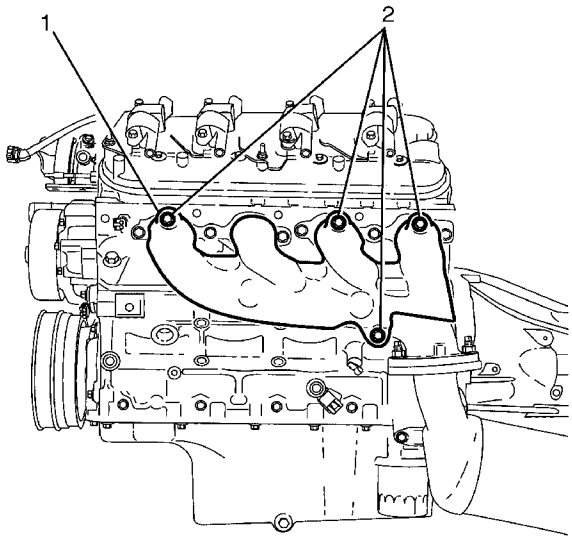
Exhaust Manifold Heat Shield Replacement - Left Side (V8)

Removal Procedure

1. Remove the engine dress cover. Refer to Engine Cover Replacement.

   Warning: Refer to Exhaust Service Warning in the Preface section.

   Warning: Refer to Protective Goggles and Glove Warning in the Preface section.



2. Remove the exhaust manifold heat shield to exhaust manifold retaining bolts (2).
3. Remove the exhaust manifold heat shield (1) from the exhaust manifold.

Installation Procedure

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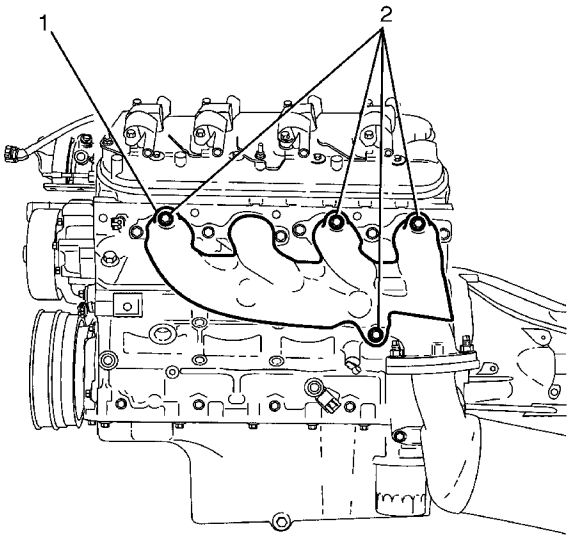


1. Position the exhaust manifold heat shield (1) to the exhaust manifold.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the exhaust manifold heat shield to exhaust manifold retaining bolts (2) and tighten to **10 N·m (89 lb in)**.
3. Install the engine dress cover. Refer to Engine Cover Replacement.

Exhaust Manifold Heat Shield Replacement - Left Side (V6)

Removal Procedure

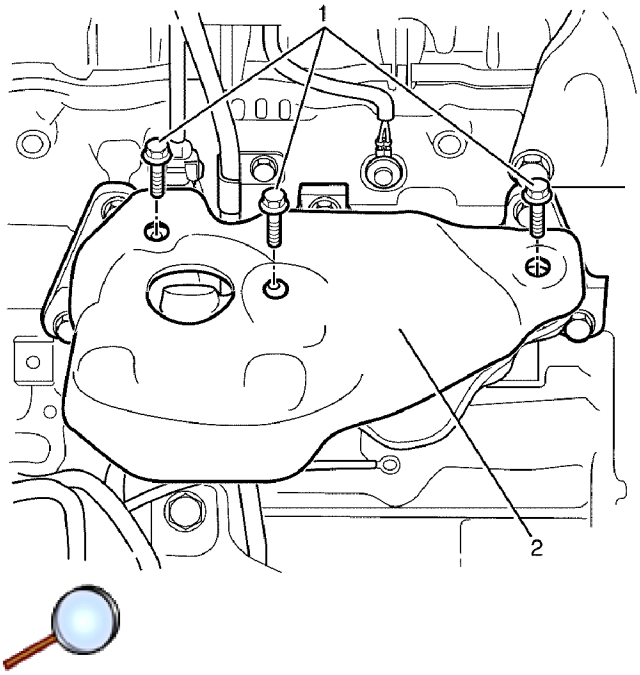
Warning: Refer to Exhaust Service Warning in the Preface section.

Warning: Refer to Protective Goggles and Glove Warning in the Preface section.

1. Ignition OFF.

Warning: Refer to Battery Disconnect Warning in the Preface section.

2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the engine cover. Refer to Engine Cover Replacement.
4. Remove the left pre-catalytic convertor heated oxygen sensor (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.



5. Remove the exhaust manifold heat shield to exhaust manifold retaining bolts (1).
6. Remove the exhaust manifold heat shield (2).

Installation Procedure

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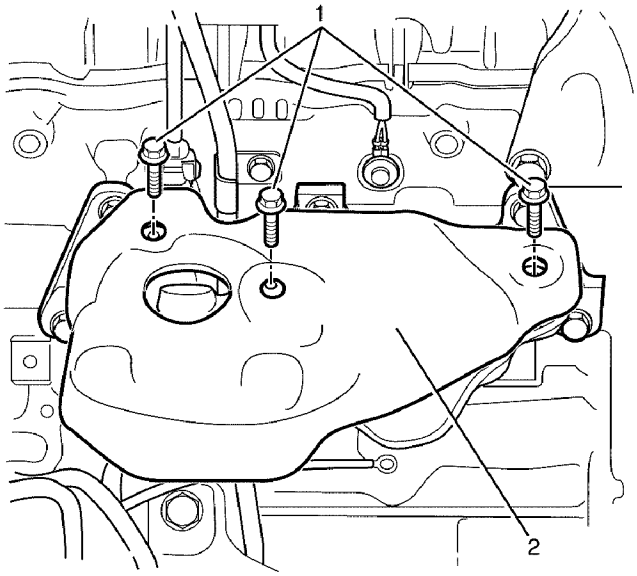


1. Install the exhaust manifold heat shield (2).

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the exhaust manifold heat shield to exhaust manifold retaining bolts (2) and tighten to **10 N·m (89 lb in)**.
3. Install the left pre-catylitic convertor HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 2 Sensor 1.
4. Install the engine cover. Refer to Engine Cover Replacement.
5. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

Exhaust Front Heat Shield Replacement

Removal Procedure

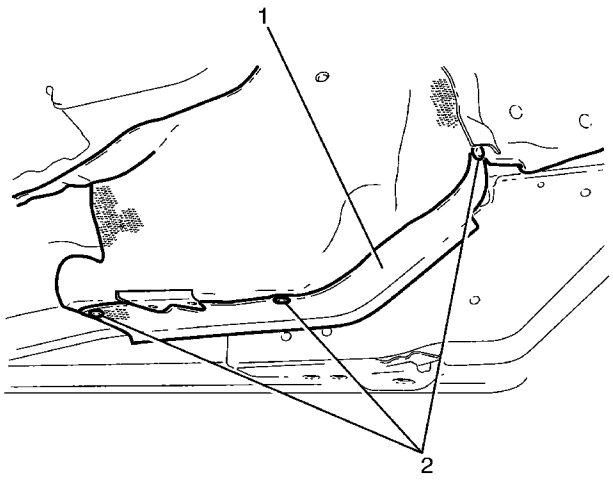
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Remove the catalytic converter. Refer to Catalytic Converter Replacement - Left Side and Catalytic Converter Replacement - Right Side.



3. Remove the front exhaust foil heat shield to body retaining bolts (2).
4. Remove the front exhaust foil heat shield (1).

Installation Procedure

1. Install the front exhaust foil heat shield (1).

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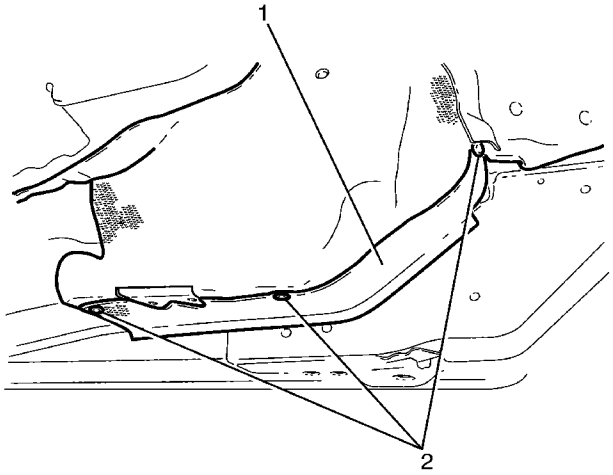


Caution: Refer to Fastener Caution in the Preface section.

2. Install the front exhaust foil heat shield to body retaining bolts (2) and tighten to **4 N·m (35 lb in)**.
3. Install the catalytic converter. Refer to Catalytic Converter Replacement - Left Side and Catalytic Converter Replacement - Right Side.
4. Lower the vehicle to the ground.

Exhaust Muffler Heat Shield Replacement - Right Side

Removal Procedure

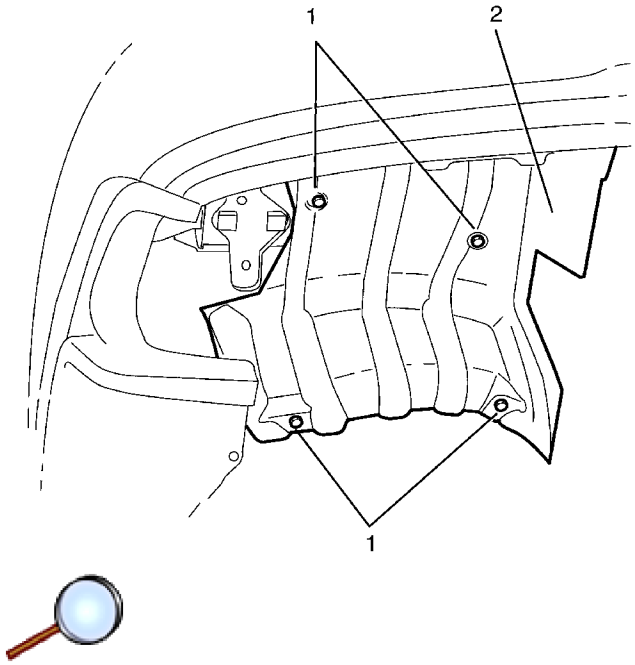
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Remove the right rear muffler assembly. Refer to Exhaust Muffler Replacement - Right Side.



3. Remove the right exhaust muffler heat shield to body retaining bolts (1).
4. Remove the right exhaust muffler heat shield (2).

Installation Procedure

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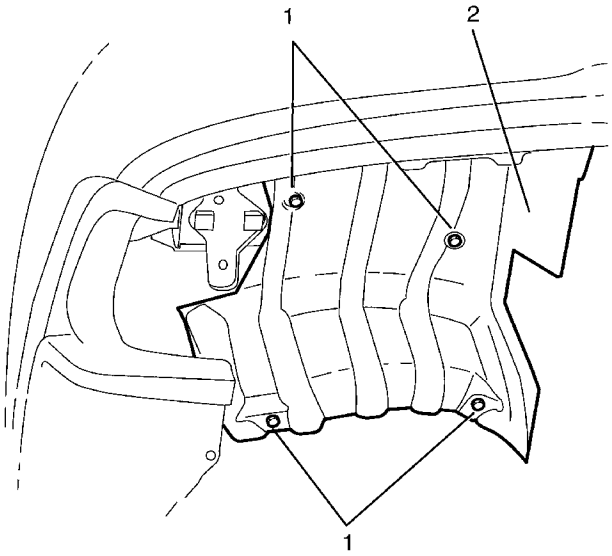


1. Position the right exhaust muffler heat shield (2) to the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the right exhaust muffler heat shield to body retaining bolts (1) and tighten to **4 N·m (35 lb in)**.
3. Install the right rear muffler assembly. Refer to Exhaust Muffler Replacement - Right Side.
4. Lower the vehicle to the ground.

Exhaust Muffler Heat Shield Replacement - Left Side

Removal Procedure

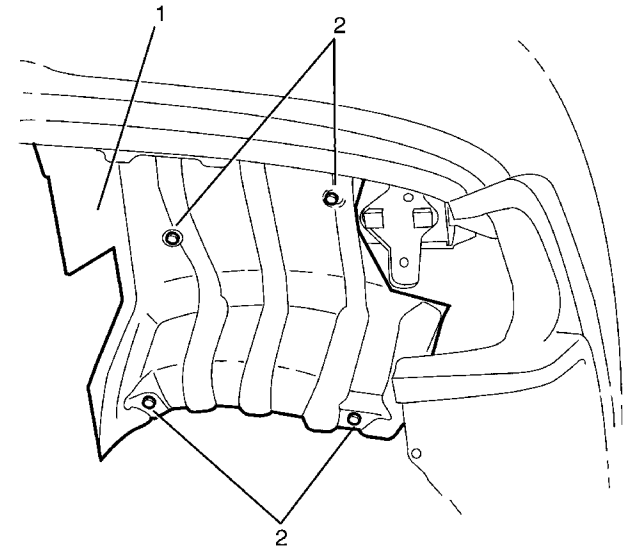
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Remove the left rear muffler assembly. Refer to Exhaust Muffler Replacement - Left Side.



3. Remove the left exhaust muffler heat shield to body retaining bolts (2).
4. Remove the left exhaust muffler heat shield (1).

Installation Procedure

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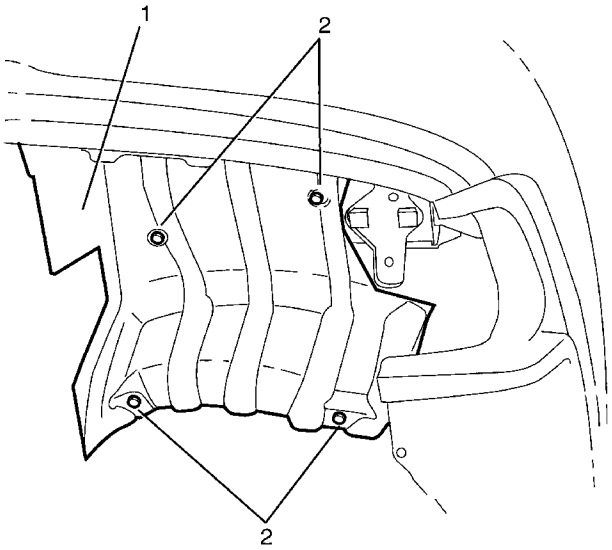


1. Position the left exhaust muffler heat shield (1) to the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the left exhaust muffler heat shield to body retaining bolts (2) and tighten to **4 N·m (35 lb in)**.
3. Install the left rear muffler assembly. Refer to Exhaust Muffler Replacement - Left Side.
4. Lower the vehicle to the ground.

Exhaust Heat Shield Replacement - Center

Removal Procedure

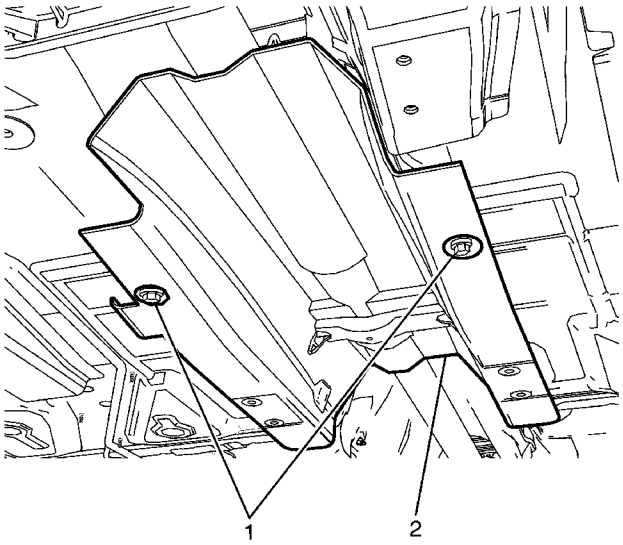
Warning: Refer to Safety Glasses Warning in the Preface section.

Danger: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

   Warning: Refer to Exhaust Service Warning in the Preface section.

2. Remove the intermediate exhaust assembly. Refer to Exhaust Crossover Pipe Replacement.



3. Remove the center exhaust heat shield to body retaining bolts (1).
4. Remove the center exhaust heat shield (2).

Installation Procedure

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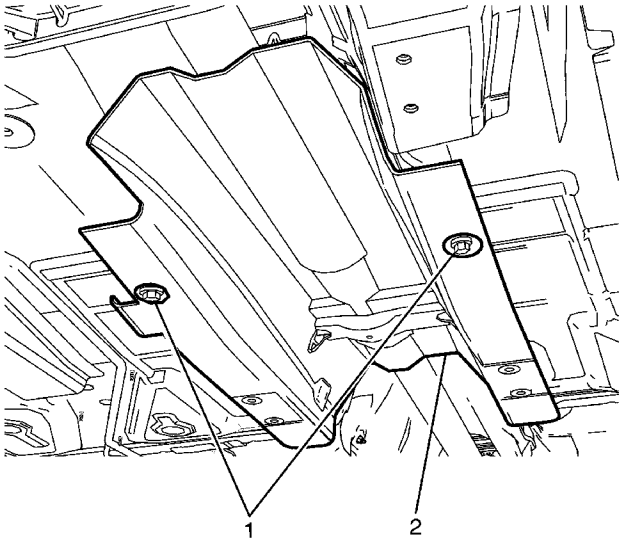

1. Position the center exhaust heat shield (2) to the vehicle.

   Caution: Refer to Fastener Caution in the Preface section.

2. Install the center exhaust heat shield to body retaining bolts (1) and tighten to **4 N·m (35 lb in)**.
3. Install the intermediate exhaust assembly. Refer to Exhaust Crossover Pipe Replacement.
4. Lower the vehicle to the ground.